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Through courtesy of W. H. Williams, Third Vice-President of the Delaware & Hudson Company, we print this week a statement of the operations of the Merchants & Manufacturers' Association of Pittsburgh, while he was its traffic manager. This document is important for two reasons: It shows how much railway traffic service can be bettered, without real cost to anybody, by organized attention to details, and it emphasizes the fact that trouble is a good deal more likely to be caused by bad service than by the rates charged, especially in merchandise traffic. During a long period of time, extending, roughly, from the spring of 1905 to the fall of 1907, it was frankly impossible to correct many serious deficiencies of service, simply because there were not cars enough or tracks enough to move with expedition all the business that offered. Now, however, traffic managers all over the country have the best opportunity which has presented itself since 1894, to abolish minor causes of annoyance, and look after all the petty details which make the difference between a contented shipper and a dissatisfied one.

### THE TRACK APPLIANCE EXHIBIT AT CHICAGO.

This exhibit may be generally divided as materials and appliances for economy and for safety. It needed the large floor space of the Coliseum, which it occupied from March 15 to March 20, during the season of the Maintenance of Way association. It was epoch making, in the quality and the quantity of the materials shown, in their value to operating department officers as well as to those in the track department, and in the financial results of the exhibit. There can, therefore, be no question as to the continuance of this feature, with great improvements in future years. A list of the exhibits has already been published. It may be worth while to consider a few defects as well as a few of the notable features.

Samples and information about tie preservation were markedly incomplete and unsatisfactory. It must have been a distinct disappointment to the many interested in this topic that there were only two exhibits of treated ties, one by the Card process which uses 25 per cent. of creosote oil and 75 per cent. of zinc chloride, and the other by the Percival Company, the air-seasoned, open-vat method, used at Houston, Texas.

Six manufacturers of tie plates showed a great variety of shapes and sizes designed for endurance, for increasing the bearing area of the spike and for resisting side thrusts. The exhibit of malleable iron plates was especially interesting, inasmuch as this is an undertaking for economical results with the initial obstacle that for equal strength the malleable plate probably costs more than the rolled plate. Opposed to this disadvantage is the fact that the malleable plate can be made in some shapes which cannot be rolled, and also that malleable iron does not corrode as rapidly as rolled steel. This subject is worth watching.

One cement tie in good condition which had been in main line service for several years was shown, and this was the only information presented on this rather discouraging development. The Carnegie steel tie was well shown. It is still doing good service, with the limitations which have been frequently discussed in these columns. Among the newer designs is the Baird tie, a pressed steel trough with upturned flange and with an inverted piece of trough for rail bearing, riveted to the flanges. The Williams tie is the reverse of this—a pressed steel trough with the flanges down. Mr. Mechling showed a heavy steel angle bent to a U shape at each end, where wooden blocks for rail carrying are bolted on. A heavy cast iron tie was shown by Mr. Shaw. Taken as a whole, the exhibit of steel ties was not as full as it might have been made.

There were many important and interesting forms of frogs and crossings, showing generally an increasing use of manganese steel for the hard service parts. Thirty years ago the Hadfields found that a steel alloy with about 11 per cent. manganese, if quenched in water from a high temperature, made a tough product with unusual resistance to abrasion. The works at Hillburn, N. Y., now roll a material with manganese 11 per cent., carbon 1 per cent., phosphorus .065 and sulphur .03.

The interesting rail testing machine of the Pennsylvania Steel Company was again shown in operation. It consists of a circular track 20 ft. in diameter, on which is a revolving arm carrying a 33-in. wheel at each end. The wheels can be speeded to 60 miles an hour. The vertical pressure on each wheel can be graded up to 41,500 lbs. The horizontal push of the flange against the rail can be graded up to 47,800 lbs. This is a rapid method of getting facts about rail wear, flange wear, flat wheels, the strength of rail joints and fastenings, and perhaps other things.

The exhibit of block and interlocking signals was complete and satisfactory. These exhibits require large spaces and.

judging from the attention they received, these devices formed the most important group in the Coliseum.

The committee of the "Road and Track Supply Association" deserves great credit, and they have received the encouragement that will doubtless enable them to make an even more complete exhibit next year.

#### THE FUTURE OF RAILWAY TERMINALS.

The President of one of the larger railway systems of the country with very costly terminals at two great cities, referring in a quiet talk not long ago to his terminal problems, spoke of a condition which held him back and made him an arch-conservative in dealing with any surface plans. It was, in brief, the steady and active development of subterranean work as a factor and force in the terminal facilities of the future. The leading officer in charge of engineering of the same corporation expressed a like opinion. It was not long ago that an important contract was signed by the New York Central and the New Haven Company for joint use of the Grand Central terminal and the Mott Haven yards. What is not, perhaps, generally known is that tunnel and subway development in and about New York City was the most potent cause—there were others—in holding up the contract for a year or more; and when signed at last it provided that the New Haven, which may be called the lessee party, should pay in proportion to actual usage of the terminals. An absolute lease with fixed payments which, under old conditions, might have been of great value not many years hence, was rejected in favor of a sliding scale based upon actual passenger business which would reduce the rent should the new subways divert part of the Grand Central business.

Such a concrete case suggests very strikingly a change in the viewpoint as to the future of great railway passenger terminals in big cities and a change which in a few years may shift hypothesis into realism. Half a decade ago the question of railway terminals in the larger cities was regarded as perhaps the most serious, in both a fiscal and a physical sense, that fronted the railway companies. The cities had grown, were growing and are still growing. City travel had become congested. The "skyscraper" had focussed population more and more at certain central points of business. Meanwhile railway terminals had become outgrown too. It affected not merely stations but roadways; and new or expanded terminals entailed enormous costs for additional realty and for rights of way without any corresponding increase of income. People laughed at the seeming undue size of the Grand Central station when it was opened for traffic 40 years ago. The old station is now a mere corner in the later and compulsory enlargements. And in less degree but still on a great scale other cities faced the railways with the same terminal problem as the metropolis. It was mainly a passenger problem, but freight had its terminal problems also.

It is a characteristic of an age of swift mechanical progress that no such question is so vast but that it tends to its own answer. The sub-way—using the term in its biggest meaning—is now entering the limbo of the railway terminal. The old theory of the terminal was concentration—a fixed point at which business outward and inward should be delivered. The new potential rests on the theory of distribution. The old theory is that of the huge centralized station; the new hypothesis does not break it up but relieves it into a great series of urban way stations. Light and air and conveniences of level will ever be the attractive constants of the surface terminal. But the principle of subway distribution must attack them sharply. It is not amid the fumes of a pipe-dream of future terminal facilities that the railway man notes the speed with which the up-to-date tunnel is driven; the ease with which it overcomes obstacles of rock, silt and quicksand; the triumphs of electricity as a motive power, as a

victor over smoke and cinder, and a giver of light. And from these his vision passes readily to a future of multiple levels of subway, amplified way stations and the elevator repeating underground to impressive depths its active function in the skyscraper above. Has science indeed thus far more than scratched those vast sub-city spaces in which the railway terminals will claim their ample share?

The prophetic vision as it looks ahead sees yet greater things. It describes local subways and express subways. It sees the through trains that pass under great cities without, perhaps, a single stop. It sees navigable waters quite as often tunnelled as bridged. It decries not merely the relief of overcrowded cities but quicker transit to the regions more remote. And, in a future not necessarily much farther away, it sees the Chicago freight subway amplified into a "necessary of life" in all the largest cities. Beginning with perishable goods it sees the problem of the freight terminal in the big city modified if not solved by the subway after the underground passenger terminal has passed into the realm of prosaic and everyday fact. The conquest of the earth's surface has begun to reach its final stages; the conquest of the tenuities of the air is still empirical; the conquest of the sub-terrene solidities, with the railways in the van of progress, already assumes shape with a practical as well as poetic vista ahead and with the railway terminal requirement of the great city as a starting point.

#### THE RAIL AND THE COUNTERBALANCE.

The recent discussions relating to flat spots on car wheels and locomotive drivers in connection with rail breakages, have brought out several instructive statements which have an important bearing on the rules for counterbalance. It is generally admitted that a good rail cannot be broken by ordinary flat spots or by the excess pressure due to counterbalance. But defective rails are broken or bent by such causes, as they produce maximum stresses to which the weaker rail yields and discloses imperfect structure or brittleness. Where flat spots on car wheels have been shown to be the cause of rail breakage the length of these spots largely exceeds the M.C.B. limit of  $2\frac{1}{2}$  in., which has been the rule for 30 years. Some recent experience in rail breakages by wheels follows:

On one road 40 rails of 85-lb. section were broken by a tender wheel having a flat spot 6 in. long. On another road 50 new rails of 100-lb. section were broken by a tender wheel with a flat spot 6 in. long  $2\frac{1}{2}$  in. wide and  $\frac{1}{2}$  in. deep. These spots referred to were not strictly flat, but the wheels were worn so that a portion of them 6 in. long was inside the proper wheel circumference. On the main line of a large eastern railway 360 rails were broken by a flat spot on the trailing wheel of an Atlantic type engine; and on the same road there were breakages of about 300 rails, most of which were attributed to a badly counterbalanced engine. A number of rail breakages have been traced to driving wheels which have spots worn more than  $\frac{1}{8}$  in. below the proper circumference, and 16 in. to 32 in. long. These are on the large wheels of high speed locomotives. The action here appears to be due to excessive counterbalance, which causes the tire to wear irregularly on the circumference, giving the effect of the rotation of an ellipse. This is aggravated by undue rail pressure produced by the heavy counterbalance. The heavy counterbalance in turn is the result of very heavy reciprocating parts.

Such experiences show that the motive power department cannot be held entirely blameless in the reports of investigations into the causes of broken rails. While flat spots on the wheels of 50-ton cars or heavily loaded tenders may search out defective rails and break them, driving wheels which are not truly circular and which have an excess counterbalance when running at high speeds will break rails which would

otherwise have given good service. In connection with the efforts now being widely made to produce safe track, there is, therefore, some responsibility to be borne by those who have to do with locomotive design and maintenance.

As the locomotive has grown to such large proportions that it is necessary to resort to a duplication of engines on one boiler, and the reciprocating parts have become so heavy, there has been a tendency to balance a smaller proportion of the weight of those parts in the connected wheels. Prior to 1896 the general rule in this country was to balance two-thirds of the weight of the reciprocating parts and divide it equally between the coupled wheels. At that time the Master Mechanics' Association adopted a rule which made the over-balance proportional to the total weight of the engine. This weight is divided by 400 and the quotient subtracted from the weight of the reciprocating parts and the remainder distributed equally among all drivers on one side. The effect of this rule is to reduce the weight of the over-balance as compared with the old rule, and it has been generally used by the railways and by locomotive builders in most of the large engines built since it was adopted.

German engineers, especially those on the Prussian state roads, have gone still further, and now have simple locomotives running with the weight of the reciprocating parts entirely unbalanced. While this practice does not appear to affect the motion of the engine when new or recently repaired, and the bearings are closely fitted and there is little lost motion, when wear takes place and the bearings are loose there is much more rattle and pound, and the wear increases as the irregular motion due to lack of balance is unrestrained. The ordinary practice in Germany is to limit the effect of the over-balance to a certain per cent. of the weight on the axle. The Canadian Pacific has adopted a rule for counterbalancing locomotives by which the over-balance weighed at crank pin circle is not to exceed one per cent. of the weight on the wheel. With properly designed reciprocating parts, the present Master Mechanics' rule would use less than one per cent. of the weight on drivers as over-balance, and where this is exceeded some attention should be given to the reduction of the weight of the reciprocating parts; in fact, it appears that the application of the one per cent. rule is a good check on the design of those parts.

Where a portion of the reciprocating weight is divided between three or four pairs of drivers there should be little danger of the over-balance becoming excessive, and more careful attention should be given to the counterbalancing of high speed locomotives with only two pairs of drivers. One objection to the one per cent. rule is the difficulty in getting the exact weight on one pair of drivers on the ordinary track scales, as the weight is usually taken when the engine first goes out of the shop and before the equalizing rigging works easily. A diagram of a heavy consolidation shows the following weights on drivers: Commencing with the front pair, 58,000 lbs., 46,500 lbs., 51,600 lbs., 52,200 lbs. While the scales may have shown these weights at the time the engine left the shop, if the engine were now to be reweighed the distribution of weight would be different.

The use of one per cent. as a maximum is a good method of detecting excess over-balance, but good design in modern locomotives should keep that weight well below such requirements. If the reciprocating parts are heavy in proportion to the weight of the engine and they are not properly balanced, the result will be internal stresses which cause rapid wear of the driving machinery and, as we have seen in the case of German engines, will increase the cost of repairs. The effort to prevent excessive rail pressures by the use of a light over-balance may be carried too far, and with reciprocating parts properly designed the Master Mechanics' standard rule for counterbalancing will keep down the over-balance about as low as the usual maintenance appropriations will allow.

## UNITED STATES STEEL CORPORATION.

The tonnage of all the products, except cement, shipped to customers by the United States Steel Corporation in the year ended December 31, 1908, amounted to only 58 per cent. of the 1907 figure. With this decrease in output, the corporation earned 4.04 per cent. on its common stock as compared with 15.6 per cent. in the previous year. This figure is taken after deducting from net earnings sinking, depreciation and replacement funds, etc., fixed charges and 7 per cent. dividend on preferred. The company is in a position to take full advantage of any improvement in the iron and steel business during 1909. It has been conservative in its depreciation charges, and for several years has been putting surplus back into the property so as to increase its capacity. It appropriated \$50,000,000 out of surplus for building the Gary plant, now in partial operation (*Railroad Age Gazette*, March 26, 1909, p. 716). By such additions and improvements as this, and by the purchase of other companies, the capacity of the corporation has been nearly doubled since its organization, as shown in the following table:

## Comparative Annual Productive Capacity.

	Capacity April 1, 1901.	By purchase of Union and Clairton T. C. Cos.	Due to additions & improvements.	Capacity, Jan. 1, 1909.
	1000 tons	1000 tons	1000 tons	1000 tons
Blast furnace products	7,440	1,228	1,000	5,322
Steel ingots	9,425	1,258	500	5,887
Rolled and other steel*	7,719	1,103	400	3,678
Cement, bbls.	500,000	.....	.....	5,600,000
				6,100,000

\*and iron products for sale.

†Made by the Companies after their acquirement by U. S. Steel Corporation.

In the last year and a half, the open hearth steel capacity has been increased by 3,000,000 tons. Of this, 500,000 tons is through the Tennessee Coal, Iron & Railroad Co. This cannot be added directly to total steel capacity, as the product of Bessemer steel was reduced 746,000 tons by the substitution of the open hearth process at certain plants.

The cement business has grown from 500,000 bbls. capacity on April 1, 1901, to 6,100,000 bbls. on January 1, 1909. Last year 4,100,000 bbls. were shipped to customers, as against 2,300,000 bbls. in 1907. This was made possible because two new plants were put in operation late in 1907. Last year an extension was begun, which when completed will raise the annual capacity of the plants operated by the Universal Portland Cement Co. to 8,200,000 bbls.

In 1908, 16,663,000 tons of iron ore were mined, a decrease of 7,318,000 tons. The tonnage of the Tennessee company is included in both years for comparison. The amount of ore from the latter region decreased but slightly. The large proportionate decrease was in the Vermilion range, whose output was almost cut in two. Coke manufactured amounted to 8,170,000 tons, a decrease of 5,375,000 tons. Coal mined, not including that in making coke, was 3,000,000 tons, a decrease of 550,000 tons, and limestone quarried was 2,186,000 tons, a falling off of about one-third. Pig iron decreased from 11,234,000 tons to 6,811,000 tons. The production of Bessemer steel ingots was 4,055,000 tons, a decrease of 3,501,000 tons, and open hearth, 3,783,000 tons, a decrease of 2,004,000 tons. The total tonnage of finished steel products was 6,207,000 tons, a decrease of 4,358,000 tons. Among these products are rails, 1,050,000 tons, a decrease of 830,000 tons; heavy structural shapes, 314,000 tons, a decrease of 274,000 tons; finished structural work, 404,000 tons, a decrease of 316,000 tons; rail joints, 85,000 tons, a decrease of 110,000 tons, and axles, 24,000 tons, a decrease of 165,000 tons.

The inventories, as of December 31, 1908, of stocks, materials and stores on hand show a total of \$143,180,000, an increase of \$6,991,000. Of these, ores amount to \$65,783,000, an increase of \$6,798,000; pig iron, scrap, etc., coal and other fuel is about the same as at the end of the previous year; steel ingots, \$751,000, an increase of \$229,000; finished prod-

ucts, \$26,000,000, an increase of \$1,131,000; stocks abroad and on consignment, \$1,255,000, a decrease of \$551,000, and material in transit, \$2,157,000, an increase of \$354,000.

The gross receipts for the year were \$482,308,000. This represents the aggregate business done by all the companies, including inter-company sales, as well as the gross receipts of transportation companies for services both to Steel Corporation companies and the public. The manufacturing cost, including ordinary maintenance and repairs and provisional charges for depreciation, was \$384,700,000. Administrative and selling cost, etc., was \$12,933,000; taxes, \$5,361,000, and commercial discounts and interest, \$2,707,000. The ordinary maintenance and repairs included above amounted to \$27,329,000, a decrease of \$8,175,000. Of this amount, about \$15,991,000 was spent on manufacturing properties, and \$2,178,000 on blast furnace relining, an increase of \$695,816. Maintenance of railway properties cost \$6,049,000, and steamships and docks, \$629,000. Extraordinary replacements are not included in operating expenses but are charged against a separate fund appropriated out of earnings. Last year the total extraordinary replacements amounted to \$10,730,000, a decrease of \$9,595,000. Of this amount there was spent on manufacturing properties \$8,543,000; on coal and coke properties, \$594,000; on iron ore properties, \$380,000; on railways, \$857,000, and on steamships and docks, \$338,000.

The total net earnings of all properties after ordinary expenses, employees' bonus funds, and interest and fixed charges of subsidiary companies, were \$91,848,000, a decrease of \$69,117,000. The appropriations for sinking funds, on bonds of subsidiaries, depreciation and extraordinary replacements amounted to \$16,965,000, a decrease of \$7,255,000. In 1907, \$3,500,000 was deducted for special replacement and improvement funds, but no such deduction was made last year. Interest and sinking funds on Steel Corporation bonds amounted to \$29,248,000, an increase of \$1,250,000, leaving, after sundry adjustments, \$45,729,000 applicable to dividends, a decrease of \$58,837,000. The final surplus for the year was \$10,343,000, no special appropriations for additions, discharge of capital obligations, etc., being made. In 1907, \$54,000,000 was so appropriated.

The balance sheet shows assets of \$1,474,143,000. This includes \$15,937,000 stripping and development at the mines and investment in structural erection and logging plants, of which \$5,640,000 was added during the year. Deferred charges to operations, consisting of payments for advanced mining royalties and expenses chargeable to future operations, amount to \$9,107,000, less \$2,800,000 fund reserved from surplus to cover possible failure to realize on advanced mining royalties. Outside investments in real estate, etc., amount to \$3,083,000; sinking and reserve fund assets amount to \$23,263,000. This includes \$13,269,000 depreciation and extinguishment fund. Accounts receivable are \$34,708,000; bills receivable, \$6,202,000, and cash, \$49,548,000.

The common stock is \$508,302,500, and the preferred, \$360,381,100. In capital stocks of the subsidiary companies not held by the Steel Corporation, \$640,000 is carried as a liability. The bonded and debenture debt, less amounts redeemed and held by trustees of sinking funds, is \$593,231,000. This includes \$1,350,000 Schoen Steel Wheel Co. first mortgage bonds, being the amount outstanding when the Schoen company was acquired by the Carnegie company in July, 1908. Bonds of subsidiary companies to the amount of \$11,921,000 are held in the treasury subject to sale, but are not included in the balance sheet as either a liability or an asset. Mortgages and purchase money obligations of subsidiary companies amount to \$4,163,000; current accounts payable and pay rolls are \$20,858,000; bills payable, \$840,000, and special deposits for loans to employees and others, \$924,000. Sinking and reserve funds amount to \$64,879,000, and bond sinking funds, with accretions, \$38,074,000. The undivided surplus of the Steel Corporation and subsidiaries amounts to \$133,415,

000, of which \$25,000,000 is the working capital provided in organization, \$80,079,000 is the balance of surplus accumulated by all companies, exclusive of inter-company profits in inventories, and \$28,336,000 is the undivided surplus of subsidiaries representing profits on sales to other subsidiaries and on hand in the latter's inventories.

The Gary improvements have been made out of the \$50,000,000 fund referred to above. Of this amount, \$18,848,000 was spent during 1908, leaving \$7,203,000 unexpended. Of the total amount spent to date on the plant, \$27,439,000 was for construction of the manufacturing plants, \$4,827,000 for terminal railway work, and \$10,531,000 for net real estate cost, and development and construction work in the town of Gary. Capital expenditures on Tennessee Coal, Iron & Railroad Co. properties during the year amounted to \$3,461,000, of which \$2,399,000 was for manufacturing plants. On other properties \$27,228,000 was spent, of which \$14,611,000 was on manufacturing properties, \$3,104,000 on iron ore properties, \$1,938,000 on coal and coke properties, and \$7,239,000 on transportation properties.

The total mileage of main line of railway owned is 873 miles. The railway equipment consists of 960 locomotives, 143 passenger train cars, 43,116 freight train cars and 2,423 work equipment. The marine equipment consists of 76 steamers and 29 barges.

#### NEW PUBLICATIONS.

*Typical Construction Work.* The Snare & Triest Co., Contracting Engineers, New York. 60 pages; 10½ x 13½ in.; bound in leather; 58 illustrations. New York, 1909.

This is a collection of photogravures. It shows construction work which is typical, both as to class and variety of the work handled by the Snare & Triest Company. In every page it is interesting and instructive, the large full-page illustrations showing work both in process of construction and after being completed. There are five views of the Queensboro bridge, New York, one of which shows the Manhattan approach during construction and the others different parts of the completed structure. This bridge was opened to partial traffic on Tuesday of this week. The large and costly Hoboken terminal of the Delaware, Lackawanna & Western is also illustrated in five different views, exterior and interior. Six coaling plants for the United States Navy, three at Dry Tortugas, Fla., and one each at San Francisco, Cal., Portsmouth, N. H., and East Lamoine, Me., are shown. There are some 58 illustrations in all, showing bridges, bridge terminals, railway construction, railway terminals, piers, ferry terminals, coaling plants, sheds, buildings, concrete construction and water works, besides some miscellaneous work.

*Architect's and Builder's Pocket-Book.* By Frank E. Kidder. Fifteenth edition. Revised; 35th thousand. New York: John Wiley & Sons. 1661 pages; 4 in. x 6¾ in.; illustrated; flexible cover. Price, \$5.

The avowed purpose of the author of this volume is to make a reference book that would have the same value for the architect and builder that the best class of engineer's pocket-books have for the civil and mechanical engineer, and this has been done. The book also possesses an advantage that is not always found in books of its class in that it is printed with a large clear type on paper thick enough to prevent the matter from showing through, and thus blurring the reading page.

It is, of course, impossible to review all of the features of such a book as this in detail, for it covers nearly the whole range of architectural and constructional knowledge. The first edition appeared in 1884 and contained 586 pages, so that the accretions of the several editions through which it has passed have brought it up to about three times its original size. Although it is definitely stated in the preface that the book was not written for engineers, the professions of the architect and engineer are so closely connected that any handbook that is of value to the former cannot fail to con-

tain much that is useful to the latter, and that is the case in this instance.

The opening pages resemble those of similar books on other subjects in that they contain the usual tables, geometrical formulae and data for mensuration. This constitutes the first part and occupies about 100 pages. The second part might be called a brief treatise on the strength of materials and the stability of structures. Here there is a somewhat greater elaboration of the subject than is usually found in hand books, and explanations and demonstrations are given that are ordinarily considered to belong to the domain of the text book. This completeness of explanation is carried through all of the details, and these comprise about everything that enters into building construction, especial attention being paid to such items, as the floor, roof, columns, arches, concrete and girders.

The last part, commencing at page 1107, contains a mass of miscellaneous data, ranging from excavations and stone work, to heating and ventilation and bolts and nuts. At the end of this part there are three things that cannot fail to be of great value and which are all too frequently omitted from books of this character. These are: a good bibliography of architectural works; a glossary of technical architectural terms, and the legal definition of a number of them; and, finally there is a comprehensive index, well worked out and seemingly complete. It is, therefore, well within bounds to place this book with the best of its class and, while intended for reference along special lines of work, it cannot fail to be of much assistance to any who have to do with the manipulation of materials in any kind of engineering construction.

*Uganda Railway.*—An illustrated pamphlet describing the Uganda Railway, in British East Africa. Published by the Railway Company, and distributed by Thos. Cook & Sons.

This is perhaps the most fascinating railway circular which has ever come into our hands. As is well known to most of our readers, the Uganda Railway extends from the port of Mombasa in British East Africa, on the Indian ocean, to Lake Victoria Nyanza, in the heart of equatorial Africa, and was built along the route so urgently advocated by Colonel Prout for strategic reasons, when he was governor-general of the equatorial provinces. The road is 584 miles long and reaches a maximum elevation of over 8,000 ft. at one point. Lake Nyanza itself is 3,650 ft. above tidewater, and for a continuous distance of nearly 200 miles the elevation of the railway exceeds one mile. In consequence of this, although it is built right under the equator, the climate is by no means bad, and in spots it is excellent.

At Nairobi, capital of the province, situated at an altitude of 5,550 ft. above sea level, the climate is reported to be most delightful, with the lowest temperature recorded about 49 degs. F., and the mean record about 69 degs., the average yearly rainfall being about 44 in. On a clear day Mount Kenia is so plainly visible that it appears to be 25 miles distant instead of 100. Its ragged peaks, covered with snow, are rendered more striking by contrast with the peak of Kinangop in the Aberdare range, which reaches the very respectable height of 12,920 ft. The road likewise passes within plain sight of Mount Kilimanjaro, which is 19,000 ft. high. The pamphlet recites with pride that these East African highlands are beginning to compete with Egypt as a winter resort.

On Lake Nyanza, which is the great gathering point for the three great highways of commerce in equatorial Africa, the Nile route to the north, the Congo route to the west and the Uganda route to the east, there are three excellent steamboats, one of 750 tons and two of 500 tons each, with triple expansion engines and twin screws, and these steamers make a journey of some 500 miles about the lake. The pamphlet states that the journey down the Nile to Khartoum is becoming quite fashionable, but it adds that on foot and by boat the time occupied in reaching Gondokoro, the frontier post in the Soudan, is from 30 to 37 days, and thence by steamer to Khartoum about 11 days. We imagine, therefore, that the

devotees of fashion do not crowd the trail uncomfortably.

Besides the redoubtable altitudes, the east coast jungles and the fascination of the strange journey to the headwaters of the Nile, the Uganda Railway, in the language of the pamphlet, runs along the boundary of the biggest zoo in the world. There are unlimited wild animals all along the route, and the varieties of them—to say nothing of the names of them—are bewildering. The district is carefully protected by game laws, but the holder of a first-class license, which costs £50 and lasts one year from the date of issue, is authorized to kill or capture the following:

2 Elephants,	2 Kudus,
1 Buffalo,	12 Topis of various kinds,
2 Rhinoceroses,	2 Neumann's hartebeests,
2 Hippopotamuses,	1 Bongo,
2 Zebras,	10 Grant's gazelles,
1 Eland,	152 other divers and sundry
4 Oryxes of different varieties,	animals, such as the
1 Sable antelope,	duiker, the impala,
1 Roan antelope,	the klipspringer and
	the paa.

But no license is required to kill lions and leopards, because lions and leopards are classed as vermin!

## Letters to the Editor.

### THREE-PHASE ELECTRIC LOCOMOTIVE VOLTAGE.

New York, March 29, 1909.

TO THE EDITOR OF THE RAILROAD AGE GAZETTE:

I have read with great interest your account of the last meeting of the New York Railroad Club and your editorial remarks on same. Permit me to point out one slight slip. You say that 3,000 volts appears to be the maximum pressure at which three-phase locomotives can be worked. This is not so and there is no pressure limit in the three-phase system. 6,600 volts is the pressure used by the Great Northern Railway and 10,000 volts by the Berlin-Zossen high speed installation. Even this is not necessarily the upper limit. In comparing single-phase with three-phase it is well to bear in mind that three-phase roads can use a pressure 1.73 times lower than single-phase roads and still have the same current density.

You mention the Midi of France which has just decided to use the single-phase system. Against this might be mentioned the Italian State Railways which have just decided to use the three-phase system for the lines out of Genoa. The former has light traffic, the latter heavy.

C. L. DE MURALT.

### REROLLED RAILS.

Pittsburgh, Pa., Feb. 18, 1909.

TO THE EDITOR OF THE RAILROAD AGE GAZETTE:

In the *Railroad Age Gazette* of January 29 appears an article declaring that the New York, New Haven & Hartford will reroll 100-lb. worn rail into 90-lb. section. This proposition presents a proper opportunity to determine, in a practical way, the relative results from using more roll passes; that is, if the New Haven company cares to make the necessary inspection before and after the rerolling.

The difference in the average number of passes used is as follows: A new 100-lb. rail primarily receives 18 to 20 passes. When rerolled into 90-lb. section it receives at least six passes more, making 24 to 26 in all, while a new 90-lb. normal section receives only 18 to 20 passes, the same as for the original 100-lb. rail. Now, what will the difference in the structure amount to between the new 100-lb. rail and the same rail rerolled to 90 lbs.? And what difference will there be in the structure of a rerolled 90-lb. section (24 to 26 passes) and a new 90-lb. normal rail rolled in 18 to 20 passes?

Some very desirable evidence can be had by investigating

the condition of rails rolled under these circumstances, with the decided advantage of subsequently applying the remedy to rails rolled new.

A. W. HEINLE,  
Metal-Rolling Engineer.

#### THAT DEPARTMENT OF DIPLOMATIC RELATIONS.

Chicago, March 6, 1909.

TO THE EDITOR OF THE RAILROAD AGE GAZETTE:

A department of diplomatic relations? Certainly, if you will regard it as a temporary affair, a specialized bureau for the education and training of officials through tactful traveling representatives or otherwise. Like the Bureau of Indian Affairs in Washington, its policy should be gradually to work itself out of existence by a progressive assimilation of its activities with the every day requirements of administrative citizenship. The true mission of departments, or rather of branches of work, should be to build up the chief of the firing line—the division superintendent. Remember, too, the distinction between "diplomacy," consideration for one's self, and "tact," consideration for the other fellow. SENEX.

#### RAILWAY ENGINEERING IN ANCIENT TIMES.

TO THE EDITOR OF THE RAILROAD AGE GAZETTE:

The account which you have printed of the Housatonic bridge of the New Haven road which was so dangerously weak that it was removed while it was still nearly new recalls another fact illustrative of the "engineering" once in vogue on that road. During the construction of what is now called the Harlem River Branch, the late A. M. Wellington took a walk over the line and found (so he declared in the *Railroad Gazette* office) the workmen setting up the trusses of a bridge bottom up.

D.

## Contributed Papers.

#### THE EIGHTH INTERNATIONAL RAILWAY CONGRESS.

L. Weissenbruch, Brussels, General Secretary of the Permanent Commission of the International Railway Congress Association, has issued the programme for the eighth session of the Congress, which is to be held at Bern, Switzerland, from July 3 to July 16, 1910.

The Permanent Commission, of which A. Dubois, of the Belgian State Railways, is President, consists of 57 members. The nine American members are: Stuyvesant Fish, Missouri Pacific; Frank Barr, Boston & Maine; Howard Elliott, Northern Pacific; Theodore N. Ely, Pennsylvania; Fairfax Harrison, Southern; Charles M. Hays, Grand Trunk; J. Kruttschnitt, Southern Pacific; L. F. Loree, Delaware & Hudson, and G. W. Stevens, Chesapeake & Ohio. The seven English members are: Lord Stalbridge and Sir Frederic Harrison, London & North-western; Sir George Armytage, Lancashire & Yorkshire; Evelyn Cecil, London & Southwestern; Sir Henry Oakley, Great Northern; H. Llewellyn Smith, Board of Trade; Walter Robinson, Great Western.

The subjects for discussion and the reporters on specific subjects are:

##### SECTION I.—WAY AND WORKS.

1. *Rail Joints*.—M. Chateau, Western of France; M. Kramer, Hungarian State Railway; Alexander Ross, Great Northern (England); M. Frahm, Royal Prussian Railways.

2. *Strengthening Track and Bridges*.—Herman Rosche, Ausig-Teplitz (Austria); M. L. Byers, Missouri Pacific; R. Codereh, Madrid & Saragosse (Spain); M. Maurer, Hungarian State Railways; P. A. Zahariade, Roumanian State Railways; E. Randich, Italian State Railways; J. Schroeder van der Kolk (Hague); M. Belebubsky (Russia); J. W. Jacomb-Hood, London & Southwestern; M. Frahm and M. Labes, Royal Prussian Railways (Berlin).

3. *Junctions and Swing Bridges*.—M. Tettelin and M. Cossmann, Northern Railway of France; C. L. Morgan, London, Brighton & South Coast; W. G. Besler, Central Railroad of New Jersey; L. Motte, Belgian State Railways.

4. *Long Tunnels*.—F. Sartiaux, Northern of France; F. Hennings (Switzerland); Francis Fox (England); M. Canat, Paris, Lyons & Mediterranean.

##### SECTION II.—LOCOMOTIVES AND ROLLING STOCK.

5. *The Use of Steel*.—D. F. Crawford, Pennsylvania Lines West; E. Szlabey, Hungarian State Railways; R. L. Ettenger, Southern Railway; O. Honigsberg, Austria Southern; Wilson Worsdell, Northeastern (England); M. Le Blant, Eastern of France.

6. *Improvements in Locomotive Boilers*.—N. Antochine (Russia); H. H. Vaughan, Canadian Pacific; M. Gerstner (Austria Hungary); G. Nolte, Moscow; C. Dassel, Belgian State Railways; J. Papp, Hungarian State Railways; M. Nadal, Eastern of France; C. B. Dudley, Pennsylvania; H. Fowler and L. Archbutt, Midland Railway (England); K. Steinbliss, Royal Prussian.

7. *High-Speed Locomotives*.—William Garstang, Cleveland, Cincinnati, Chicago & St. Louis; M. Courtin (Karlsruhe).

8. *Electric Traction*.—Dr. Gleichmann (Munich); George Gibbs, Long Island Railroad; Dr. Wyssling (Zurich).

##### SECTION III.—WORKING.

9. *Large Stations*.—H. A. Jaggard, Pennsylvania Railroad; A. Kain, Hungarian State Railways; M. Jullien and M. Leverve, Orleans (France).

10. *Operation of Switches and Signals*.—L. H. N. Du Four, Netherlands State Railways; Dr. Ulbricht (Dresden); E. C. Carter, Chicago & North Western; L. Weissenbruch and J. Verdeyen, Belgian State Railways.

11. *Passenger Tickets*.—Director von Stierlin, Wurtemberg State Railway, Stuttgart.

12. *Motor Vehicles*.—T. H. Riches, Taff Vale (Wales); C. P. Clark, Buffalo & Susquehanna; L. Greppi, Italian State Railways.

##### SECTION IV.—GENERAL.

13. G. R. Jebb (Birmingham, England); W. E. Hoyt, Special Engineer (New York Central Lines); C. Colson, French Government Railways.

14. *Statistics*.—W. M. Acworth (London); Sir Thomas Rees Price, Central South African Railways; E. F. Knibloe, Buffalo Creek Railway; M. De Geynst, Belgian State.

15. *Motor Car Services*.—J. C. Inglis, Great Western (England).

16. *Perishable Freight*.—J. M. Culp, Southern Railway; M. Bloch, Orleans Railway (France).

##### SECTION V.—LIGHT RAILWAYS.

17. *Branch Lines*.—M. Quarre, Midi Railway (France).

18. *Working of Light Railways*.—M. Ploq (France).

19. *Locomotives and Rolling Stock of Narrow Gauge Light Railways*.—M. Jesser, Austria Southern.

20. *Transshipment*.—C. de Burlet, Belgian State Railways.

*Freight Car Interchange and Demurrage*.—W. F. Allen, Secretary, American Railway Association.

The number of persons who traveled on Belgian lines in 1907 amounted to 161,184,538, an increase of 946,952 over 1906. The total receipts from passenger traffic in 1907 were \$16,604,589, an increase of \$838,738 as compared with 1906. The increases are attributed to the travelers who have taken advantage of reduced rates offered under present conditions; to the abolition of the additional tax imposed on passenger travel or express trains; to the decrease in the price of commutation tickets, and to the increase of two days in the limit for which return tickets can be used. The government plans to do a good deal of extension and betterment work on its lines during the next year or so.

## WILLIAM P. HENSZEY.

William Peddle Henszey, a partner of the firm of Burnham, Williams & Company, proprietors of the Baldwin Locomotive Works, died at his home, 313 South Broad street, Philadelphia, on Tuesday morning, March 23. He was in his seventy-seventh year, having been born September 24, 1832. Of Huguenot descent, his father was Samuel C. Henszey, at one time treasurer of the Western Saving Fund of Philadelphia.

He was educated in the public schools of Philadelphia, and in July 1848 was graduated from the old Philadelphia High School on Juniper street. He started in mercantile business, studied mechanical engineering, and on March 7, 1859 became a draftsman in the works of M. W. Baldwin & Company. Mr. Baldwin was a mechanic of the old type, who believed in personal instruction to his men and experimental development of design rather than in the more modern methods of theoretical development by means of drawings. What drawings there were were incomplete. Card-board models were largely used. It is a tradition of the works that in those early years it was Mr. Baldwin's practice to go directly to the workmen in his shops, and with a piece of chalk sketch upon the floor his designs for parts required. Mr. Henszey had to learn from his seniors in the works, and from such books and engineering publications as were then available on the art and mystery of mechanical design.

At that time, 50 years ago, M. W. Baldwin was getting old, and Matthew Baird was in charge of contracts for locomotives. George Burnham had the financial and office management, and Charles T. Parry was superintendent of the works. Until Mr. Henszey's time comparatively little attention had been given to symmetry of design. William Mason, of Taunton, Massachusetts, was the first locomotive builder to study graceful proportions and symmetrical forms while striving to attain the best engineering practice. Mr. Henszey appreciated Mr. Mason's work, and followed in the same line, combining correct mechanical design with appropriate, simple and graceful forms. His success was such as to give his work a distinct character. In collaboration with Mr. Parry, the "consolidation" type of engine was designed, and the first one constructed for the Mahanoy Division of the Lehigh Valley Railroad, displacing the flexible beam truck locomotive which Mr. Baldwin brought out in 1842-1846, and which had more than any other type contributed to Mr. Baldwin's reputation and fortune.

Alexander Mitchell of Wilkes-Barre suggested the general plan of an eight-wheeled locomotive with leading pony truck. Mr. Baird was opposed, but Mr. Parry and Mr. Henszey favored it and the locomotive was built in 1866.

When Mr. Henszey joined the Baldwin Locomotive Works, less than 1,000 locomotives had been built, while at the time

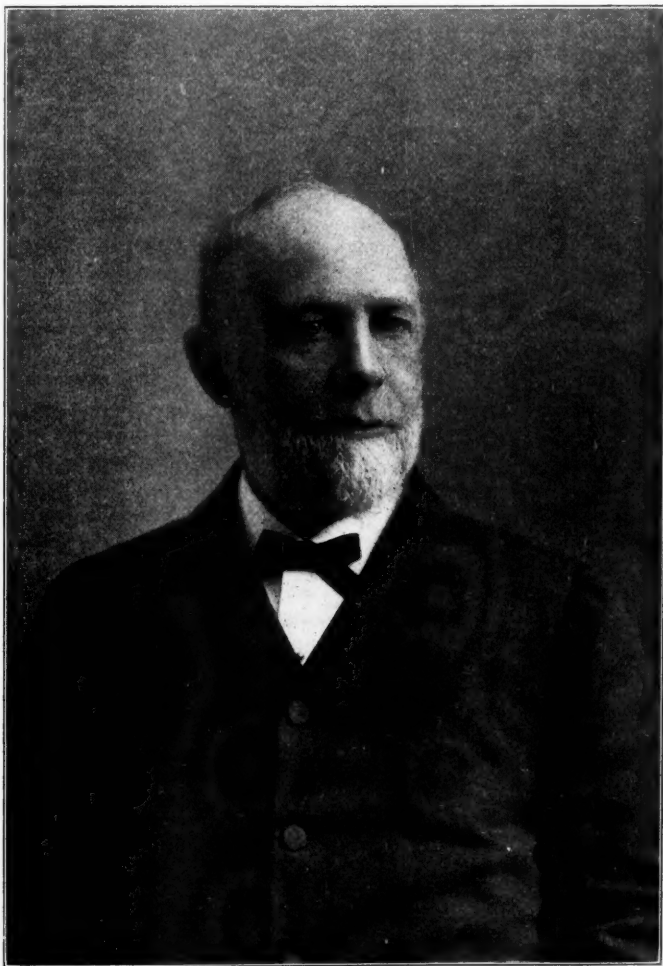
of his death the number had reached over 33,000. In his own experience, therefore, he had seen the construction of some 32,000 locomotives and had had personal connection with the designs of all the important types.

As a designer he was noted not only for his good taste but for the speed of his work. Those competent to judge have remarked that Mr. Henszey could put lines on paper faster than any other draughtsman within their knowledge. The celerity of his work was not accompanied by any inaccuracy or want of taste; on the contrary, his designs were characterized by symmetry and grace. He early realized the importance of standardizing locomotive parts of a locomotive, and so securing uniformity of details. Instead of each locomotive being an individual machine, he endeavored to standardize the axles,

driving and truck boxes, wheel centers, tires, eccentrics, pistons, etc. Nearly all the gages, etc., were originated by him and the works began the development of the system of standard gages and templets which has characterized to this day the construction of Baldwin locomotives. As early as 1839 Mr. Baldwin had felt the importance of making all like parts of similar engines absolutely uniform and interchangeable. It was not, however, until 1861 that a substantial beginning was made in organizing all departments upon this basis, and from it has since grown an elaborate and perfected system embracing all the essential details of construction.

During his long experience of fifty years, Mr. Henszey found abundant opportunity to exercise his skill as a designer in the improvement of locomotive details. During the earlier years of his work little or no attention was paid by him to the protection of his inventions by patents, but beginning in 1880 patents were taken, largely to define priority as compared with other inventors. A list is appended of a number of patents which were taken out by him from time to time:

- March 18, 1880. Locomotive engine.—Locomotive with single pair of driving wheels and device for increasing weight on drivers.
- September 17, 1880. Locomotive boiler.—Firebox "as wide or wider than distance across the driving wheels."
- November 9, 1880. Narrow-gage locomotive.—Device for increasing the capacity of the firebox in a narrow-gage locomotive by depressing the frames between the driving wheels and allowing the firebox to extend laterally over the depressed portions.
- June 13, 1882. Reversing gear for locomotives.—A steam reversing mechanism consisting of a steam cylinder controlled by a hydraulic cylinder in which the liquid passes around the piston from one end of the cylinder to the other. A valve in the passageway checks the flow at any desired point.
- September 3, 1895. Locomotive.—Atlantic type.
- March 3, 1896. Steam locomotive.—An arrangement of the steam passages in a locomotive cylinder in which the steam is admitted to the valve through a passage surrounded or enclosed by the exhaust passage. This patent was declared invalid in 1903.
- August 20, 1895. Frames for locomotives.—Design for frame of Atlantic type locomotives.
- June 2, 1896. Electric locomotive.—In this device, the motors are mounted wholly on the frames of the locomotive, in order to avoid as far as possible the jar to which the wheels and axles are



William P. Henszey.

subjected. The power is transmitted through an intermediate crank axle.

June 23, 1896. Electric locomotive truck.—The main features of this truck are the strengthening plate connecting the two side frames, the special arrangement of the equalizing bars, the construction of the boxes and the arrangement of the bolster.

September 8, 1896. Truck.—This is a truck intended particularly for electric locomotives and embodies a special arrangement of cross-framing. It also includes the hinging of the front and back pedestals in order to facilitate the removal of the wheels and axles.

September 12, 1899. Electric mine locomotive. David Leonard Barnes and William P. Henszey.—The main feature is the utilization of the motor casting as a portion of the frame of the locomotive.

October 23, 1900. Locomotive.—In this device two locomotives of the ordinary type are coupled back to back making a flexible wheel base. The throttle levers and reverse levers for both engines can be operated by one engine driver at his post on either locomotive.

It will be of interest to note that his first patent was for a locomotive with a single pair of driving wheels and a device for increasing the weight on drivers, and that it related to a locomotive of 4-2-2-type, the driving wheels being in front of the firebox, and a pair of trailing wheels behind the firebox. This locomotive was designed for the New York Division of the Philadelphia & Reading Railway, and was intended to take a light passenger train from Philadelphia to Jersey City in 90 minutes. The time-table on this basis, however, was never put into effect.

Reference may also be made to the patent taken September 3, 1895, for a locomotive of the Atlantic type. This patent embraced some of the important details accomplished in this design of locomotive. The first engine on this plan was designed and built by the Baldwin Locomotive Works for the Atlantic Coast Line in 1895. The conditions to be met were light rails and high speed, with a train of considerable weight, thus requiring a boiler and firebox of large capacity and necessarily of greater weight than it seemed advisable to carry in the ordinary manner on two pairs of driving wheels. The trailing truck was therefore added, which enabled the construction of a boiler of large heating surface, with a firebox of sufficient depth for good combustion, and of width which afforded ample grate area.

Mr. Henszey became a partner in 1870, eleven years after he had joined the works. His experience practically covered the development of the locomotive, from the simple machine of 1860 to the variety of types and the enormous weights of locomotives characterizing the practice of the present day. By his skill and efficiency he contributed largely toward the perfection of details involved in such development.

Like all real designers, Mr. Henszey was careful and accurate, so that when he reached conclusions it was not necessary for him to change. Another of his characteristics was a willingness not only to acknowledge errors of his own but to recognize merit in others. He was quick to appreciate all improvements in locomotive practice made by other manufacturers and designers.

In his personal character Mr. Henszey was noted for his unfailing amiability and benevolence. He was active in good works in every direction, and the world little knows of the many benefits which he conferred on deserving causes. Brought up in the Society of Friends, he never severed his connection with that body, but he also took part in the worship of other denominations, and aided liberally in the establishment and maintenance of churches in which he was interested.

#### TRAIN ACCIDENTS IN FEBRUARY.<sup>1</sup>

Following is a list of the most notable train accidents that occurred on the railways of the United States in the month of February, 1909. This record is intended to include usually only those accidents which result in fatal injury to a

<sup>1</sup> Abbreviations and marks used in Accident List:  
rc, Rear collision—bc, Butting collision—xc, other collisions  
—b, Broken—d, Defective—unf, Unforeseen obstruction—unx, unexplained—derail, Open derailing switch—ms, Misplaced switch  
—acc. obst., Accidental obstruction—malice, Malicious obstruction of track, etc.—boller, Explosion of boiler of locomotive on road  
—fre, Cars burned while running—P., or Pass., passenger train—F., or Ft., freight train (includes empty engines, work trains, etc.)—Asterisk, Wreck wholly or partly destroyed by fire—Dagger, One or more passengers killed.

passenger or an employee or which are of special interest to operating officers. It is based on accounts published in local daily newspapers, except in the cases of accidents of such magnitude that it seems proper to write to the railway manager for details or for confirmation.

#### TRAIN ACCIDENTS IN THE UNITED STATES IN FEBRUARY, 1909.

##### Collisions.

Date.	Road.	Place.	Accident.	Kind of Train.	No. persons reported—	
					Kil'd.	Inj'd.
3.	C. & M. & St. P.	Powersville.	bc.	Ft. & Ft.	3	1
3.	Seaboard A. L.	Abbeville.	bc.	Ft. & Ft.	3	0
5.	Southern	Lumber City.	bc.	Ft. & Ft.	1	2
16.	Atl. C. Line	Tyty.	bc.	Ft. & Ft.	2	3
*18.	Ft. W. & D.	Sunset.	rc.	Ft. & Ft.	0	3
†*22.	Pennsylvania	Delmar.	rc.	P. & Ft.	8	2
22.	Nrflk & So.	Bayville.	rc.	P. & P.	0	10

##### Derailments.

Date.	Road.	Place.	Cause of derilmt.	Kind of Train.	No. persons reported—	
					Kil'd.	Inj'd.
2.	Seaboard A. L.	Richland.	unx.	Ft.	0	7
4.	C. & M. & St. P.	Rushford.	unx.	Pass.	0	10
7.	Illinois Cent.	Coldwater.	ms.	Pass.	2	20
14.	La. Ry. & Nav.	Baton Rouge.	cow.	Ft.	1	6
†14.	Mo. Pac.	Union.	unx.	Pass.	1	6
15.	Pennsylvania	Newton Hmltn.	landslide.	Pass.	0	1
†16.	Illinois Cent.	Murphysboro.	b. rail.	Pass.	4	20
20.	Tex. & Pac.	Gloster, La.	unx.	Ft.	2	0
22.	Southern	Harbins, S. C.	unx.	Pass.	2	0
25.	C. & M. & St. P.	Kellogg, Minn.	b. rail.	Ft.	1	1
26.	C. & M. & St. P.	Van Horn, Ia.	b. wheel.	Pass.	1	10

The worst collision in this record, that at Delmar, Del., on the twenty-second, occurred about 3 a.m., and one engineman, one baggageman, one express messenger and four mail car employees were killed. In consequence of the large number of passengers going to Hampton Roads to see the naval vessels, which had just returned from their voyage around the world, the regular southbound passenger train was run in three sections, and the collision was between one of these sections and two engines standing on the main line waiting to take one of the sections southward, Delmar being the point where engines are regularly changed. According to one of the reports, the engines had been allowed to stand on the main line without being protected by red signals, because it was understood that the second section of the train would be 15 minutes behind the first one; whereas in fact it was only four minutes behind. The standing engines, the engines of the train and the express and mail cars of the train were badly wrecked. The wreck took fire at once, from coals which were spread from the fireboxes of the engines, and some or all of the persons killed were burned to death. There was a dense fog at the time.

The next collision in the list, that at Bayville, is also reported to have been an incident of the extra traffic to Norfolk on account of the battleships.

The derailment at Coldwater, Miss., on the seventh, was declared by an officer of the road to have been due to malicious misplacement of the switch at which the train was wrecked.

In the derailment near Baton Rouge, La., on the fourteenth, the engine of the train was running backward. With all of the cars in the train, it fell off a trestle to the ravine, 35 ft. below.

The train derailed at Newton-Hamilton, Pa., on the fifteenth, was the 18-hour express from Chicago to New York. The accounts say that at the time of the derailment the train was running about 45 miles an hour. In the landslide was a rock weighing 12 tons or more. There was a dense fog at the time. The cars of the train were all derailed but were not overturned, and all of the 51 passengers on the train were reported as having escaped with nothing worse than slight bruises.

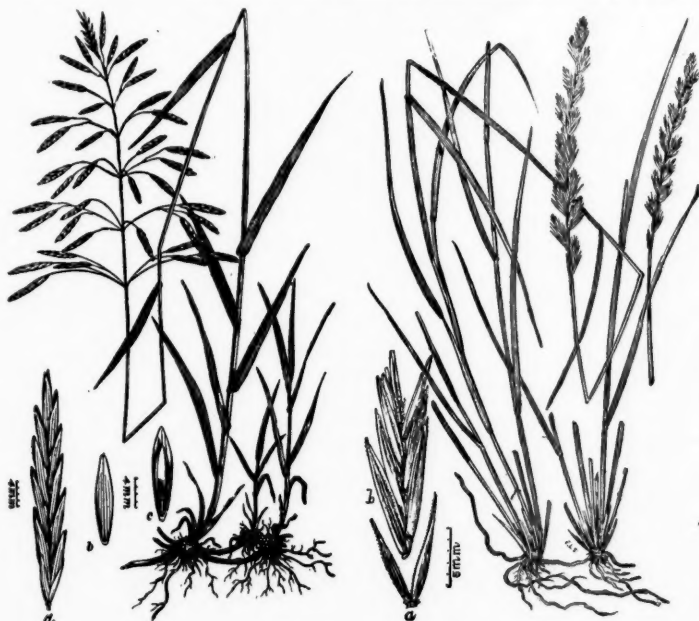
Of the four serious electric car accidents reported in the newspapers in February, one, at Cleveland, Ohio, was accompanied by three fatal injuries. In this case a street car was struck by a locomotive and was broken in two. It appears that there was a derailing switch at the crossing, but, by reason of the view being obstructed by steam from a stationary engine, or some other cause, the conductor appears to have allowed the car to go on to the crossing in the face of the steam locomotive. One person was killed in the derailment of a street car, due to a broken axle, at Pittsfield, Mass.

## HOLDING RAILWAY BANKS WITH GRASS.

BY L. H. PAMMEL, PH.D., AMES, IOWA.

Men have long made use of certain grasses to hold soils. Soil-binding grasses have been used in Holland to make more land. They have been used in the Cape Cod region to protect the lighthouses, and prevent the encroachment of shifting sand dunes. Prof. F. Lamson-Scribner says: "The digging out and undermining by swift currents, the beating of waves on lake and ocean shores and the perpetual shifting about of loose sands by the waves and winds, cost our country many millions of dollars annually."

Mr. Westgate says: "The problem of controlling the drifting sands of the cape has concerned the municipal, state, and national authorities for two hundred years; the extensive planting of beach grass as a means of protection dates back for more than a century. Many houses stand where a century ago small boats found convenient anchorage; in fact, certain areas



Hungarian Brome Grass.

Western Wheat Grass.

have been filled in several hundred feet during the last half century." The most effective grass here is the beach grass (*Ammophila arenaria*), which is of course not suitable for planting away from the Atlantic coast. Prof. Hitchcock also states that "the best grass is the beach grass which grows naturally along the sandy seashores of the North Atlantic coast. The same species grows along the shores of the Great Lakes and on the Atlantic coast of the United States as far south as North Carolina."

"The grass is transplanted in rows or squares in autumn or spring. Satisfactory results cannot be produced by sowing the seed of this or other plants directly upon the unprotected sand."

In some cases the railways have used seed screenings from seed houses and sowed them on the banks and fills. I need not say that railways should not sow an indiscriminate lot of screenings. These screenings contain a large number of objectionable weed seeds. Some states have laws on the presence of certain weeds along highways and railways, and others are likely to pass similar laws. It will cost more to remove these weeds finally than if some other material had been used; although the first cost is less, it is more expensive in the end.

To determine whether such planting would be feasible the Iowa Agricultural Experiment Station made an experiment a number of years ago on the Chicago & North Western Railway between Ames and Ontario. In the experiment undertaken we also used timothy, Hungarian brome grass (*Bromus inermis*).

Canada blue grass (*Poa compressa*), sheep's fescue (*Festuca ovina*), blue grass (*Poa pratensis*), western wheat grass (*Agropyron Smithii*), Western brome grass (*Bromus marginatus*), orchard grass (*Dactylis glomerata*), a sedge (*Carex*), growing on the edge of the "fill," and red and white clover. It was not difficult to get a stand of the red and white clover. In fact, on the north side of the track the plant blossomed very well by the end of the season, but the cold weather destroyed many of the plants during the winter. Some, however remained, and by sowing an additional quantity of red and white clover seed in the spring of 1904 we had an excellent stand on the north side of the track. On the south side it was difficult to get a start owing to the dryness of the soil. The Hungarian brome grass, which was sown just as the other grasses were, made an excellent start on the north side, and here and there a patch on the south side.

The sedge was a total failure. The intense heat and dryness made it impossible for this plant to get a good start. The orchard grass grew well on the north slope, but its habit of growth makes it undesirable. Blue grass was nearly a failure on the south slope, but succeeded much better on the north and shady slope.

Brome grass and blue grass should be planted on the north side of the track. If properly managed this will make a good sod in the course of a few years, but the young plants should be protected with red and white clover. On the south side of the track western wheat grass and Canadian blue grass should be used.

This experiment has shown that the right of way can be



Western Wheat Grass on Chicago &amp; North Western Bank Near Ames, Iowa.

planted with desirable plants which will hold the banks. It has also been shown that where a road runs east and west the north side of the fill needs to be planted with a type of plant different from that on the south side. We have found that Hungarian brome grass is one of the best grasses to sow on the north side. Here it is possible in the course of a year to get a good stand, and especially so in two years, if some of the plants are allowed to go to seed. The picture shows such a stand after a number of years on a steep fill near Ames. Brome grass will not do nearly as well on the south side, although it will do better than timothy or blue grass. One of the best grasses on the south slope is the Western wheat grass (*Agropyron Smithii*) which is a relative of quack grass, but much better than this because it is adapted to dry conditions. Western wheat grass is abundant on the plains east of the Rocky mountains as far east as the loess bluffs of

western Iowa. It may be found in numerous places along railways where it has been introduced. The plant has a bluish color.

Quack grass is objectionable because some of the northern states have legislated against the weed, and it is so destructive to agricultural crops. Railways cannot afford to jeopardize the agricultural crops on which their earnings depend.

These grasses should be sown in the early spring or, preferably, in late fall. The brome grass should be sown in the fall. In the early spring a little clover, 6 pounds to the acre, can be sown on top of the ground. The Western wheat grass seed cannot be purchased as there is none in the markets, but arrangements can be made in the summer, with someone where the grass grows, to have it collected.

#### STREET RAILWAY INTERLOCKING AT WASHINGTON.

At a number of street railway junctions in Washington, D. C., interlocking switch and signal plants are now being installed in which the signals (consisting of electric lights, showing green for proceed and red for stop) are fixed in waterproof boxes beneath the pavement, between the rails; and the signalman is in an octagonal tower of only 4 ft. inside diameter, which is perched on an ornamental column, on or near the sidewalk, and thus is raised above the heads of passing pedestrians.

Fig. 1 shows the arrangement of the tracks and the wiring at Delaware avenue and C street, N. E. All cars approach

—called the control cabinet—which makes a contact, completing a circuit to a solenoid which actuates the switch. The lever is arrested when the stroke is a little over half completed, by the latch of the return indication magnet catching it. This latch is lifted after the switch has completed the stroke, when the control lever can be pushed over to the end of its stroke.

The two return indication magnets on each switch lever have circuits completed respectively by contacts made in the switch-throwing mechanism at each end of the stroke, so that until the switch has actually completed its stroke, the control lever cannot complete its stroke. Suitable mechanical interlocking being provided, it is therefore impossible to give the motorman a clear signal until the switch is in a safe position.

The switch being thrown, the towerman presses the lever controlling the signal for that switch, and, if it is not locked by reason of the towerman having set a switch or a clear signal for a conflicting route, he thereby clears the signal. At the start of the stroke the circuit to the red light is broken and at the end of the stroke the circuit to the green light is made. At the end of the stroke a latch drops and locks the signal lever in the reverse or clear position. The signal lever is worked against a compression spring which, when the signal lever latch is lifted, returns the lever to its normal position. The green or proceed light having been given, the motorman proceeds, and as the car is passing out of the limits of the crossing the shoe on the plow of the car actuates a signal

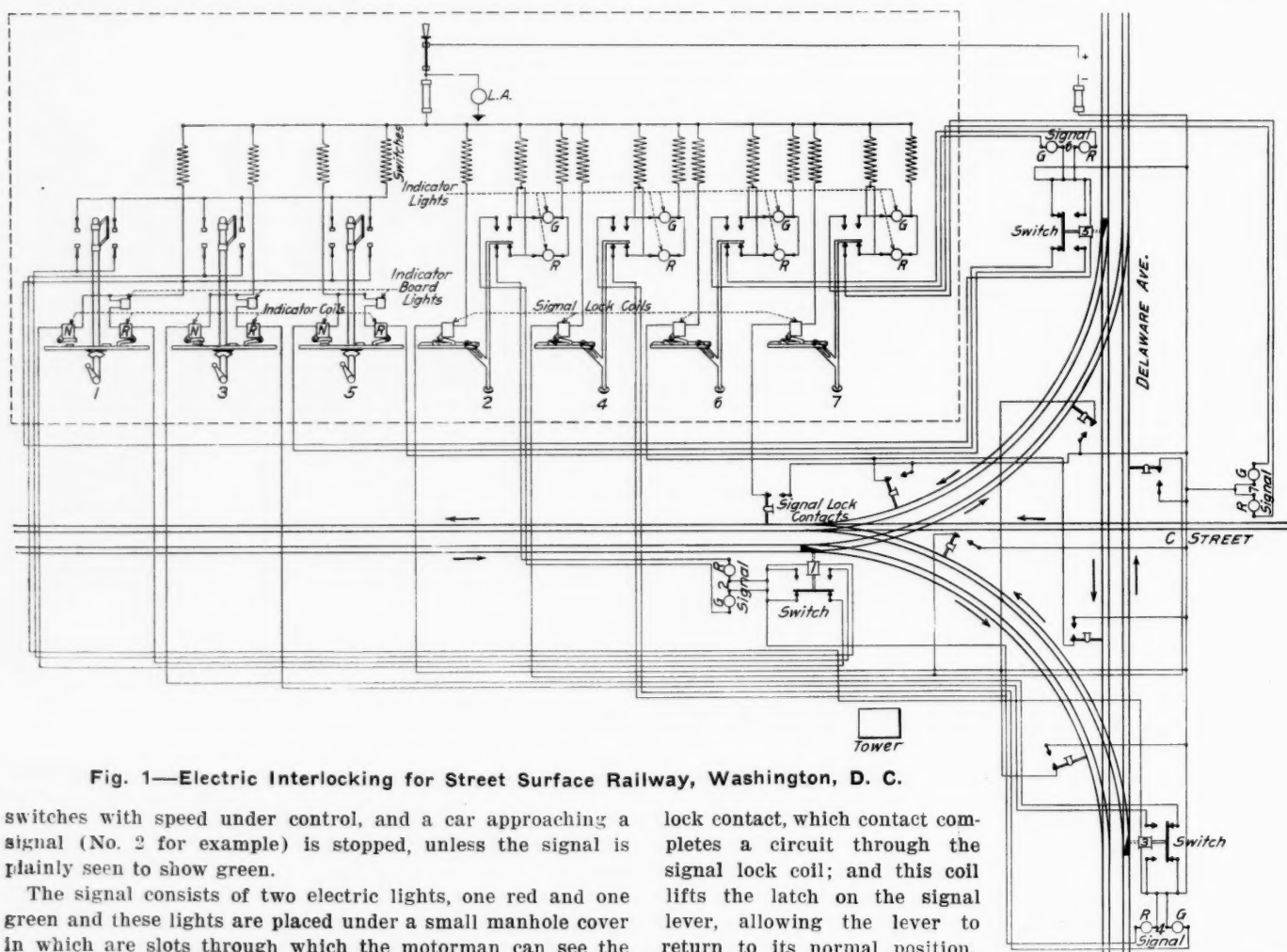


Fig. 1—Electric Interlocking for Street Surface Railway, Washington, D. C.

switches with speed under control, and a car approaching a signal (No. 2 for example) is stopped, unless the signal is plainly seen to show green.

The signal consists of two electric lights, one red and one green and these lights are placed under a small manhole cover in which are slots through which the motorman can see the lights. This "manhole" is between the rails of the track, so that the lights are exactly in front of the approaching motorman. The lights are enclosed in a heavy, water-tight, glass case. One light only shows at a time and the normal indication is red, stop.

To set a switch the towerman rotates a lever in the machine

lock contact, which contact completes a circuit through the signal lock coil; and this coil lifts the latch on the signal lever, allowing the lever to return to its normal position.

The mechanical interlocking insures that when a signal is cleared the switch lever for the switch controlled by that signal cannot be thrown until the signal is restored to normal, and, as just explained, this cannot occur until the car is over the crossing. This arrangement prevents the movement of the switch while a car is passing over it.

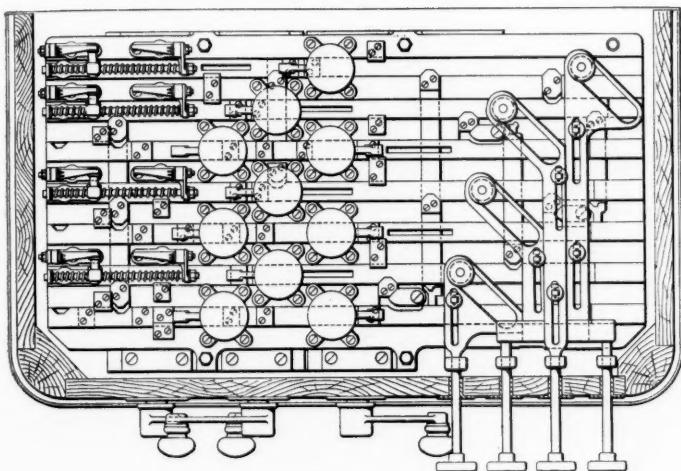


Fig. 3—Plan.

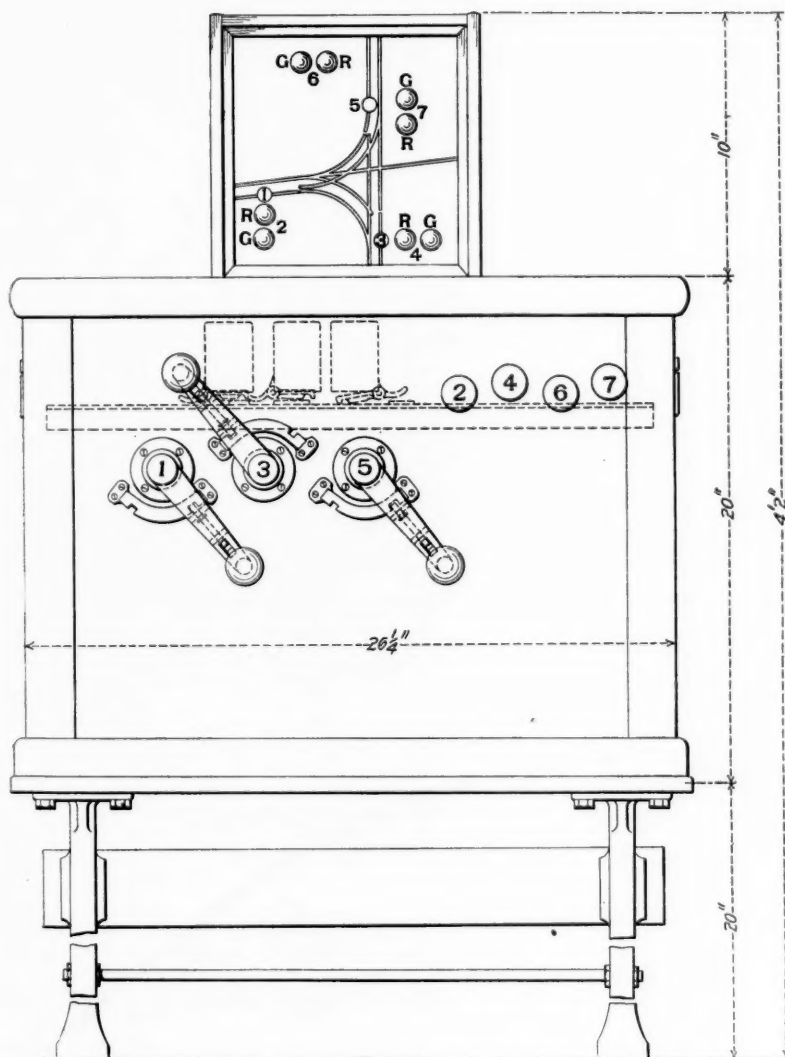


Fig. 2—Front.

**Electric Switch and Signal Machine; Automatic Switch Company.**

The switch-throwing mechanism is actuated by a solenoid, and, by means of a reversing cam-plate, movement is given to the switch, first in one direction and then in the other.

The control cabinet has a track model, as shown, which repeats the switch movements, and also has miniature lights which repeat the signal indications.

The interlocking required here is different from regular high speed steam railway practice in that one green light is given for the car to proceed whether the switch lies to the right or to the left. This modification is accomplished by a swinging

latch on each of the levers, Nos. 1, 3 and 5, which accomplishes additional locking when the levers are reversed.

The tower is mounted on a single specially designed artistic column with a granite base and with anchor bolts imbedded in concrete. The towers are octagonal and only 4 ft. in greatest inside measurement. Those at the Union station are specially designed to be harmonious architecturally with the general surroundings of the station.

The towerman climbs the column by means of concealed steps and enters the tower through a trap door in its floor. The tower is sufficiently high from the ground to give the towerman a good view of the cars and it is not in the way of pedestrians.

The column has a door in the side which allows telephone, brooms, switch irons, etc., to be put inside the column out of sight.

The first plant to be installed is that at Delaware avenue and C street, N. E., on the lines of the Capital Traction Company and the Washington Railway & Electric Company. The

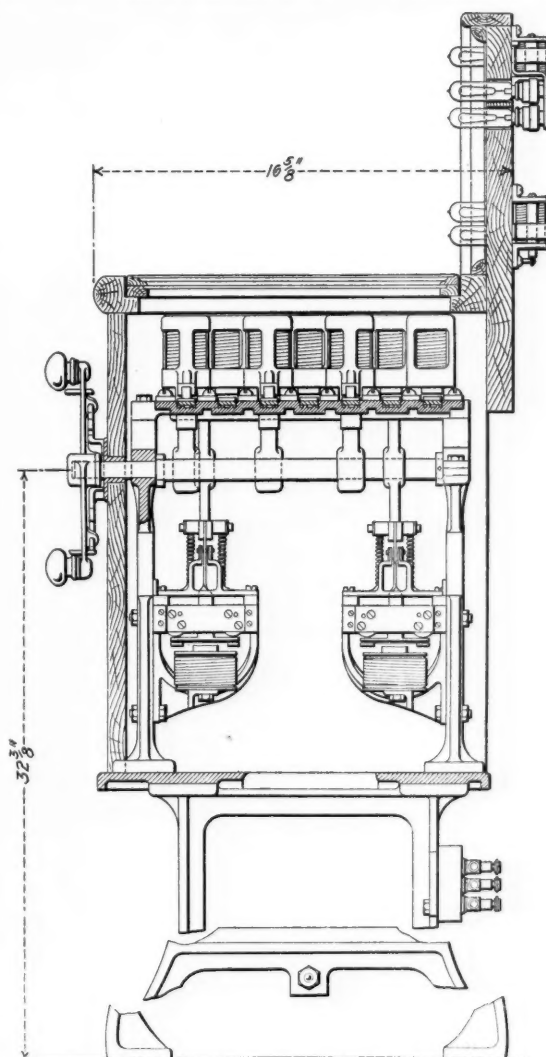


Fig. 4—Section.

other junctions to be equipped are two at the plaza of the Union station, one at North Capitol street and Massachusetts avenue and one at First and B streets, S. E.

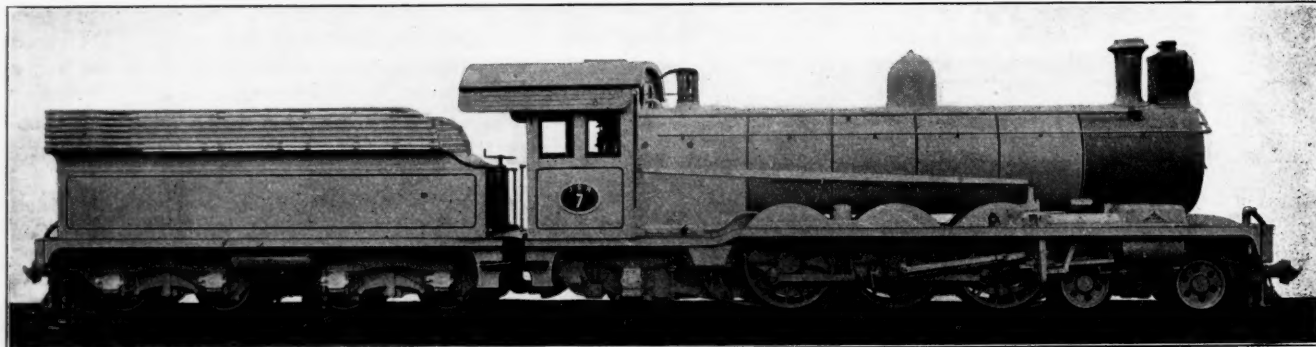
This apparatus is made by the American Automatic Switch Company, New York city. The advantages of providing absolute fixed signals to govern the movements of cars at a busy junction or crossing are obvious; and the superiority of an arrangement like this, with the switchman eight feet above the ground, as compared with a man standing on the pavement with hand flags or lanterns, needs no demonstration.

### NEW LOCOMOTIVES FOR THE FEDERATED MALAY RAILWAYS.

Included among the more interesting types of locomotives recently built for main line service on Indian or Far Eastern roads are a number of 4-6-2 engines, with double bogie tenders, which are being delivered by Messrs. Nasmyth, Wilson & Co., Ltd., of Patricroft, near Manchester, for duty on the meter gage lines of the Johore State Railway.

a deflector and guard plate, the latter being required to protect the copper sheet from abrasion.

The boiler is fed by two self-acting, re-starting combination No. 8 injectors, located on either side of the back head. They take steam through a 1¼-in. pipe leading down from near the top of the dome, and deliver through pipes carried forward above the crown sheet and turned down so as to discharge just above the center line of the boiler and, therefore, well below the surface of the water.



Meter Gage Pacific Locomotive for the Federated Malay Railways.

The boiler and firebox roofsheet are of mild steel and the firebox, which is of the Belpaire shape, is of copper, with staybolts of the same material. The roofsheet is not, however, of the Belpaire form, but is semi-circular and carries the crown sheet by means of sling and radial screw stays, the sling stays being located at the front in the usual place. It will be noticed that this method of staying and forming the crown sheet brings the outer stays into the roofsheet at a rather sharp angle—so sharp, in fact, that it is impossible to secure a full thread all the way across the sheet, and this was one of the main arguments brought against radial staying in the United States, which resulted in arching the crown sheet so as to secure full threads in both sheets. The tubes are of solid drawn brass and are given a camber of 1⅝ in. at the center. Camber is seldom used in American boilers and when it is employed such an amount as this would be considered excessive. As the buoyancy of the tube itself is quite sufficient to serve as its center support without the introduction of the extra support of the camber, the bend in the tubes serves merely as a preliminary buckle to permit of a lessening of the stresses on the tubesheets due to expansion, and it is for this that this camber is used. The cross-section of the boiler at the smokebox shows, too, that the upper rows of tubes are kept well away from the sides of the shell—so far, in fact, that it has been necessary to introduce stays to brace the unsupported flat surface of the front tubesheet. This provides for a free downward circulation and the delivery of the feedwater to all parts of the boiler unimpeded by the upward currents rising from the tubes. At the back head there are also stays that extend out through the water space and take hold of the rear course of the shell. These are somewhat longer than those ordinarily used in the United States, where they are usually attached to the outside side sheet, which not only makes a lighter stay, but does not offer the same obstruction to circulation.

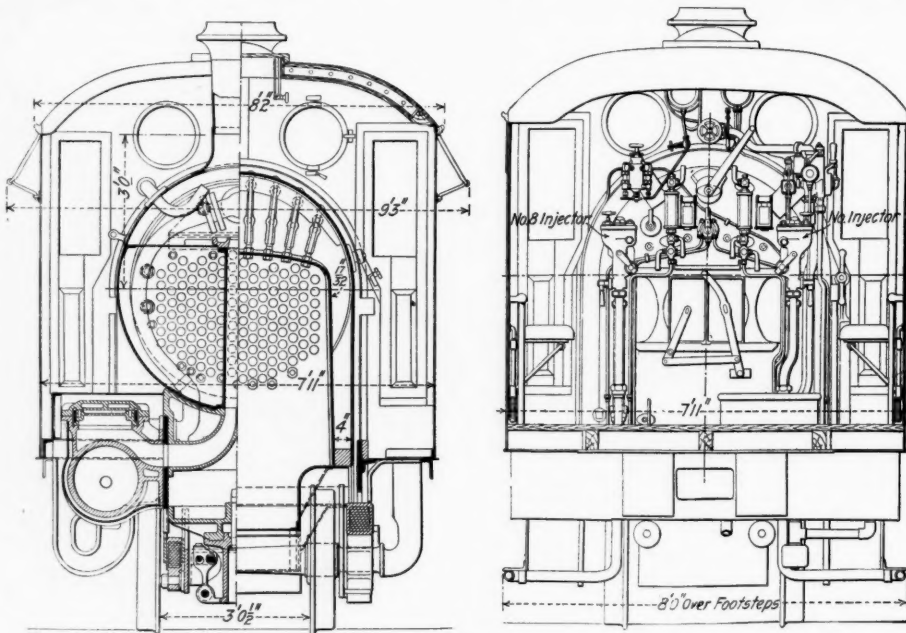
The firedoor is formed in the usual manner and is fitted with

A duplex 2¾-in. Ramsbottom safety valve is placed on top of the roofsheet.

The cylinders are outside the frames and have their steam chests on top. They are inclined 1 in 16 so as to secure the proper clearance for the front truck wheels. This truck is of the swing link pattern.

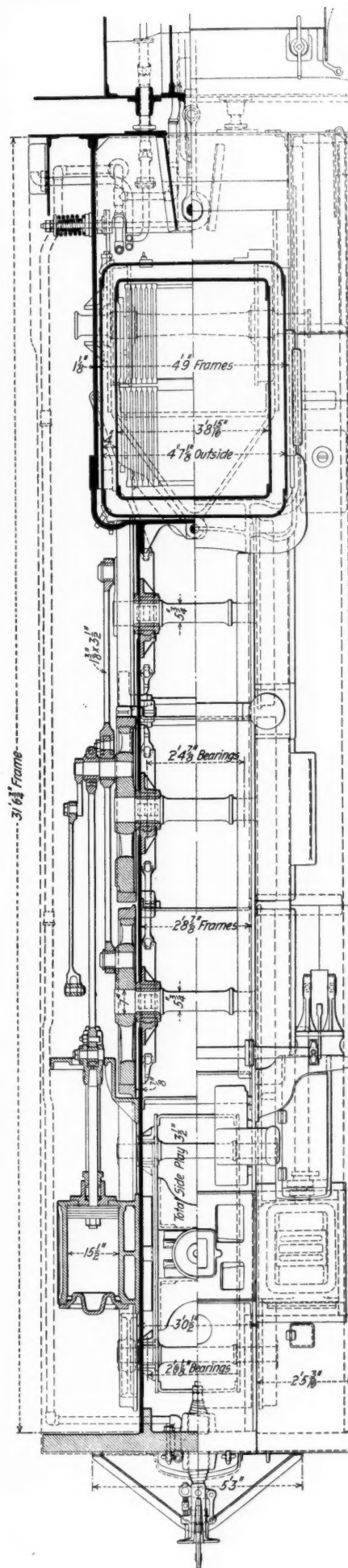
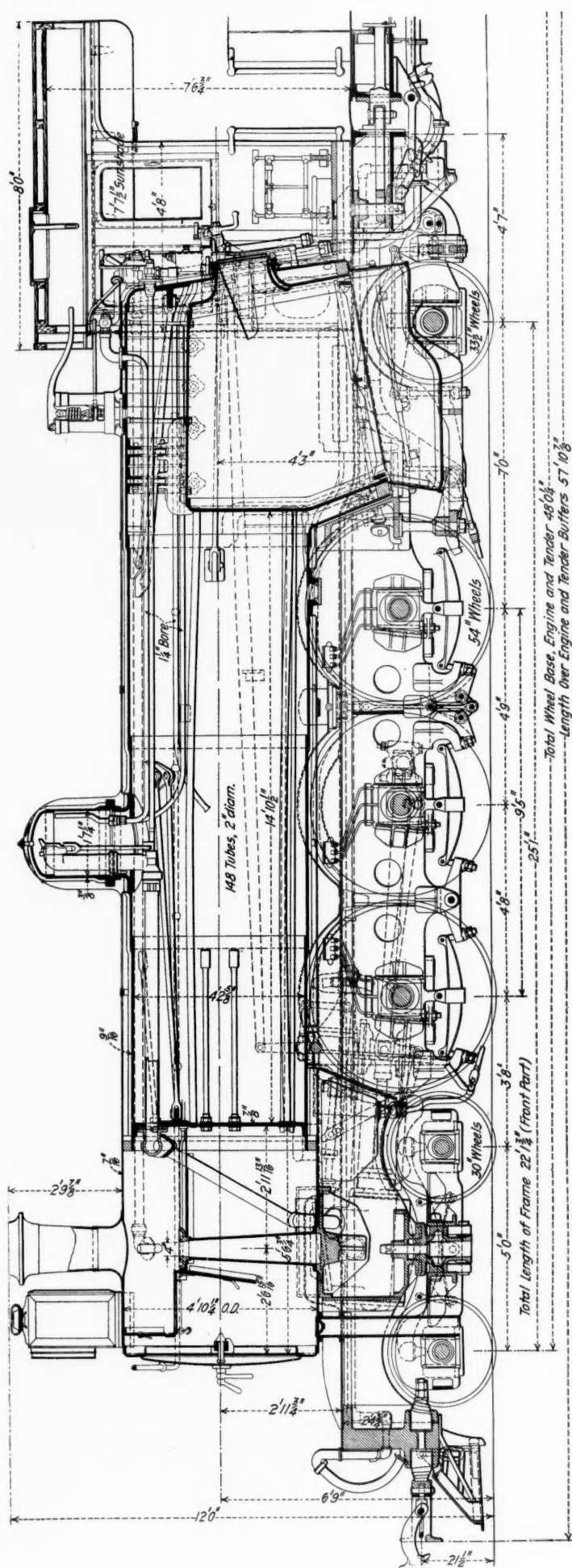
The Walschaerts valve gear is used, and is operated by the usual reversing screw.

The trailing truck is of the Bissel type, with 3-in. lateral play, and is controlled by helical springs that are placed out-



Half Sections and Rear Elevation.

side the frames. The suspension springs, which are under the axle boxes, are fitted with adjustable links. The spring suspension and equalization is divided into three sections. There is that of the front truck, which is by itself in the usual manner. Then the first and second pairs of drivers are equalized together with underhung springs and equalizer bar between. Finally, the rear drivers are equalized with the trailing truck. This is a modification from the method of equalizing all of the drivers with the rear truck that will probably produce unequal wheel loads at times. The driving boxes are



Sectional Plan and Elevation; Pacific Locomotives for the Federated Malay Railways.

each fitted with three oil pipes for maintaining the lubrication when the engine is in motion—one for journal lubrication and one each for the front and back wedges.

A wedge brake, operated by a steam cylinder, is set between the two rear pairs of driving wheels, but no brakes are used upon the front drivers or upon any of the truck wheels.

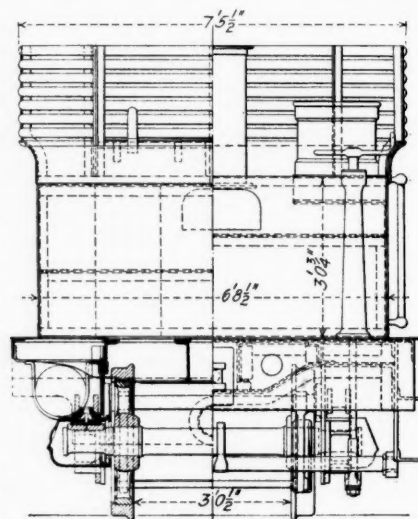
The main frames are of the plate form and are thoroughly stayed throughout and fitted with a cast-steel distance piece in front of the firebox, and have the rear portion widened out. The cab is roomy and is provided with an upholstered seat for the driver and adjustable sun shades. The front buffer beam is of cast iron and is fitted with a central combined buffer and drawgear. The distinctively American features about the locomotive are the pilot and the headlight.

The tender is of steel, with an underframe built up of channels and angles, the former being used for the center sills. The tank is rather smaller than that used for the same size cylinders in the United States, but the fuel space, that has been increased above the normal capacity by the racks is quite up to ordinary capacities.

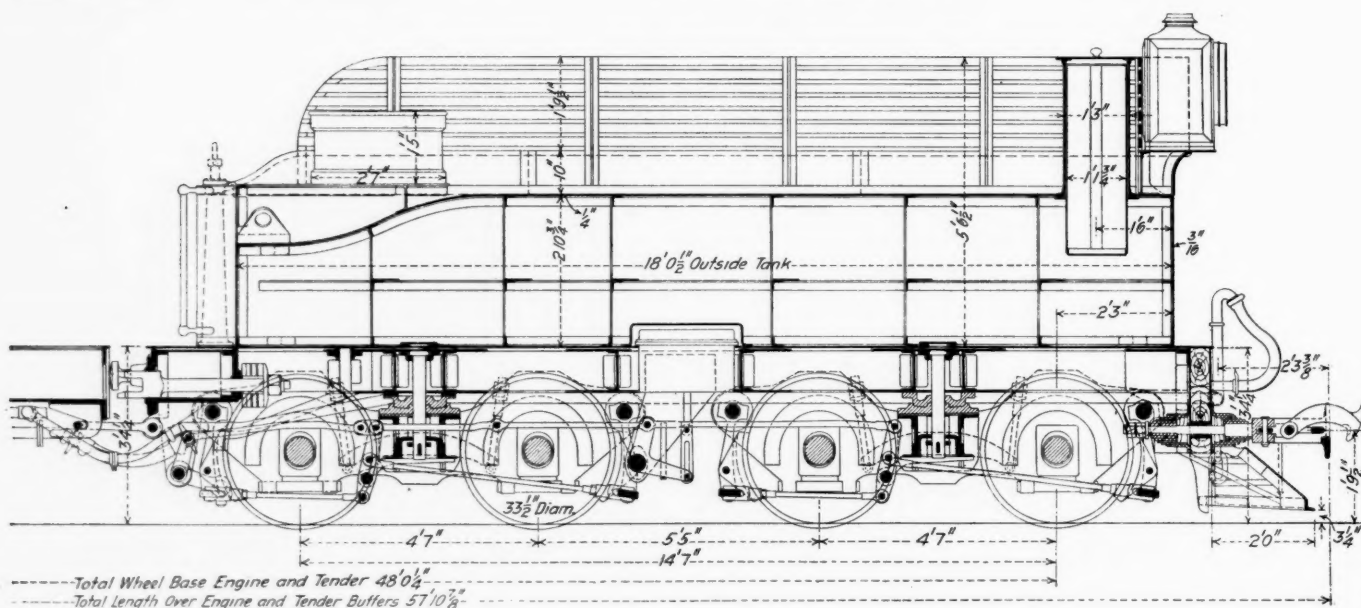
The draft gear at the rear of the tender is the same as that at the front of the engine, and a pilot and headlight are also provided at this point for use in running backward. Between the engine and tender the draft gear differs radically from American practice, where there is used nearly rigid connection, in that the drawbar is cushioned by rubber discs, while on each side there are buffers supported by volute plate springs.

The tender is fitted with both the hand and vacuum brake, and it will be seen that the foundation rigging is not interfulcrumed or floating. The stem from the diaphragm takes hold of the horizontal arm of a bell crank, while the vertical one actuates the brake levers. The connection to the rear is under tension, while that to the front is in compression. Further, the live levers are pivoted so that with new shoes on each wheel they must be worn down successively before all can be brought to a bearing. This is a feature of European practice that has persisted in places for many years, to the exclusion of the interfulcrumed type of brake that is in universal use in the United States.

These locomotives were built under the supervision of the chief inspecting engineer for the Crown



**Half Front and Rear Elevation of Tender.**



### Sectional Plan and Elevation of Tender.

Agents for the Colonies, the consulting engineers being Messrs. Gregory, Eyles & Waring, of Westminster.

The following are some of the principal dimensions of these engines:

Cylinders, diameter	15 1/2 in.
Piston stroke	24 in.
Bogie wheels, diameter	2 ft. 6 in.
Coupled wheels, diameter	4 " 6 "
Trailing wheels, diameter	2 " 9 1/2 "
Bogie wheel base	5 " 0 "
Fixed wheel base	9 " 5 "
Total wheel base	25 " 1 "
Boiler barrel, diameter at center	4 " 3 3/4 "
" " length between tube plates	14 " 10 1/2 "
" " center line from rail level	6 " 9 "
Firebox, length	6 " 6 1/2 "
" " outside diameter	4 " 3 "
" " inside diameter	3 " 0 "
Heating surface, tubes	1,152.5 sq. ft.
" " firebox	82.5 "
" " total	1,235.0 "
Grate area	18.5 "
Working pressure	180 lbs.
<i>Tender.</i>	
Wheels, diameter	2 ft. 9 1/2 in.
Bogie wheel base	4 " 7 "
Centers of bogies	10 " 0 "
Total wheel base	14 " 7 "
Tank capacity	2,000 gals.
Fuel space	315 cu. ft.
Weight	29 1/2 tons
<i>Engine and Tender.</i>	
Weight	77 tons
Total wheelbase	48 ft. 0 1/4 in.
Total length over buffers	57 " 10 7/8 "
Tractive effort	16,359 lbs.

Total weight	=	3.98
Tractive effort		
Tractive effort x diameter of drivers	=	715.29
Heating surface		
Heating surface	=	65.75
Grate area		
Firebox heating surface	=	6.68*
Total heating surface		
Total weight	=	52.70
Heating surface		
Displacement, 2 cylinders, cu. ft.	=	5.24
Total heating surface	=	23.57
Displacement, 2 cylinders		
Grate area	=	3.53
Displacement, 2 cylinders		

\*Per cent.

## THE RAILWAYS OF BRITISH COLUMBIA.

### THE GRAND TRUNK PACIFIC.

Last year's progress in railway building in British Columbia was disappointing by comparison with what had been expected, and the same remark holds good with regard to all the railways in Canada. Several years ago when the Grand Trunk Pacific and other important railway bills were up for discussion in the Dominion Parliament, members favoring the bills predicted a rate of speed in construction that has not been realized, and the result is a feeling of disappointment and depression in the districts which the new lines of railway are intended to serve. Under its agreement with the government the Grand Trunk Pacific is to be open for traffic between Winnipeg and Prince Rupert, on the Pacific, by the fall of 1911, the government upon its part undertaking to have ready its portion of the National Transcontinental railway from Winnipeg to the Atlantic. Neither the Grand Trunk Pacific nor the government portion of the new transcontinental line is, from present indications, at all likely to be completed by the time stipulated for by the Dominion Parliament.

The line from Winnipeg east to Lake Superior Junction, which has given much trouble in construction, will be completed, and the Grand Trunk Pacific connection from Fort William to Lake Superior Junction will also be in running order. But from Lake Superior Junction east to meet the

line extending west through Quebec and Ontario progress promises to be much slower than was at first anticipated. From Winnipeg west, across the prairies, construction has met with few difficulties as far as Edmonton, and beyond it to the Yellow Head pass, but between that point and Prince Rupert work is far in arrears. It looks very much as if the Grand Trunk Pacific management would be quite content, for some years at any rate, to handle only the traffic from the agricultural areas of the prairies to navigation on Lake Superior. Difficulty in obtaining money on favorable terms is said to be the principal cause of the delay, both on the part of the Grand Trunk Pacific and of the Canadian government. In addition, it is stated that there is considerable friction between the English directorate of the Grand Trunk railway and the directors of the Grand Trunk Pacific, which is a Canadian incorporation. A very serious matter for the Grand Trunk is this. Two sessions ago the Canadian Parliament passed an act providing that the 33 1/3 per cent. preference on British goods imported into Canada should apply only to goods of British origin and British manufacture, imported in British ships at Canadian ports of entry direct. After opposing this measure Sir Wilfrid Laurier's government accepted it with the modification that it should not take immediate effect, but should come into operation by proclamation of the Governor-General in council at any time, the government promising that such proclamation should be made out not later than the year 1911. This was to give the Grand Trunk Pacific and National Transcontinental time to get ready to handle the trade of the Grand Trunk that now goes to Portland, Me. If the Grand Trunk cannot get the government to hold over the enforcement of this tariff measure it will be a very serious matter for the railway, and in the present temper of the parliament and people of Canada it is doubtful if any delay will be permitted.

As regards Prince Rupert, the Grand Trunk Pacific railway's terminal on the Pacific, it is not by any means the ideal port and town-site that it was believed to be when it was first selected. The area of available land for tracks and building purposes is insufficient unless a very large amount of money is expended in making a further very unpromising looking tract suitable for town-site purposes. Then again, recent developments in the shipping trade of the Pacific have not been altogether encouraging for the new port. So far as the surveys and exploration have yet disclosed there is not much traffic to be expected for many years to come from that section of the Grand Trunk Pacific that lies between Prince Rupert and the Yellow Head Pass. The traffic will have to come from the country east of the Rockies. It will fall to the railway company to provide shipping from its new port, at least in the first instance, and this will involve large outlay for which the company may have a difficulty in securing funds. The Empress line steamers of the Canadian Pacific railway are said to be doing particularly well to Japan and China at present, and the Canadian-Australian liners are doing better than they have ever done, the passenger trade between Sydney, New South Wales and Vancouver showing up specially well, though the return cargoes from Australia are still very light. James J. Hill's experience in opening up a trade between Seattle and the Orient is not altogether encouraging to new beginners in the same line of business on the Pacific coast.

### THE CANADIAN PACIFIC.

The Canadian Pacific has been doing a great deal of useful work on its lines in British Columbia, mostly in the way of betterment. Its lines on Vancouver island (the Esquimalt & Nanaimo Railway, which it bought some years ago) are now in excellent condition and are being extended to the other side of the island where an important seaport will probably be established. In this case an up-to-date modern railway ferry will be brought into operation between Vancouver terminal on the mainland and Vancouver island. This would

effect a considerable saving of time for mails and passengers between England and the Orient, a branch of their service which the Canadian Pacific have been sedulously cultivating for some years past. At Field, in the very heart of the mountains, the gateway of a region of marvelous glaciers and sublime scenery, the Canadian Pacific Railway is carrying out a very heavy piece of engineering work. At this point the grade is very steep and has, as a consequence, added materially to the cost of working the entire Pacific division. To attain its present grade, the line zig-zags its way up the mountain sides. A tunnel of great length is now being driven in the shape of the figure "8." An eastbound train entering this tunnel at Field will gain the elevation needed, in the passage through the tunnel, and in a few minutes emerge high above Field, just as if had been carried up on an elevator. While the Canadian Pacific Railway engineers and officers are very proud of the new tunnel, it is probable that it will be used for freight trains mainly, as the scenery at Field is the most wonderful and the grandest between Montreal and Vancouver, and passengers will prefer to look upon the great works of God rather than the chiselings that the hand of man has made in them.

During the coming summer the Canadian Pacific Railway transcontinental service will probably again be accelerated, and so quickly is the traffic growing that there is every possibility of another daily train being required. The double-tracking of what is known as "the spout," between Winnipeg and Fort William, will have the effect of easing the whole traffic of the line from Lake Superior as far west as Banff. The work of double-tracking has gone on as rapidly as possible in the face of many difficulties—difficulties greater in some instances than would be met with in building an entirely new railway. At Lethbridge, in Alberta, a new departure is being made. Here the Crow's Nest Pass branch passes through a long stretch of low-lying prairie that is subject to floods when the snow is melting or after heavy rains. To keep the road-bed on this section of the line in anything like good order has in the past been well-nigh impossible, and a heart-breaking job at that. The whole of this part of the country is for the future to be traversed on a sort of diminutive trestle work, which in some places may not be more than two feet in height and in others ten or twelve feet. Of the Hill railways, except in so far as they affect Vancouver, New Westminster, and the valley of the Lower Fraser river, there is not, as yet, very much heard in British Columbia. It is expected that before long the Canadian Pacific Railway will again have to enlarge its docks, sheds and terminal tracks at Vancouver for the trade is increasing by leaps and bounds, and the population of the city is rapidly catching up with that of Winnipeg.

New Westminster, with its population of about 12,000, is now practically a suburb of Vancouver, with which it has excellent and frequent communication by the British Columbia Electric Railway Company's lines. This company is an English concern, excellently well managed and yielding good returns to its shareholders. It operates the street railways in Victoria, Vancouver and New Westminster and is extending its line some sixty miles into the Chilliwack districts of the Lower Fraser valley. This is about the most fertile district in British Columbia and the company expects to do an enormous business in hauling vegetables, fruit, farm and dairy produce, firewood, etc., to Vancouver. At present Vancouver imports about 50 per cent. of its vegetables and fruit from California, Oregon and Washington. R. M. Horne Payne is chairman of the British Columbia Electric Railway Co. in London. He is also resident director in Europe of the Canadian Northern Railway.

#### THE CANADIAN NORTHERN.

Since Prince Rupert was fixed upon as the terminal of the Grand Trunk Pacific there has been much talk in British Columbia, and especially in Victoria, its capital, about the

route to be taken by the Canadian Northern to the coast, and the point that it will select as its terminal. While no definite pronouncement has been made by Messrs. Mackenzie and Mann, the general impression is that from the Yellow Head pass the Canadian Northern will come straight down to the coast at Butte Inlet. There it will cross at the Seymour narrows by a steam ferry to Vancouver island, and then on to Esquimaux and right in to Victoria. While it is the seat of government, the provincial legislature, the judicature, and other public offices, Victoria of late years has become more and more a winter resort for wealthy Winnipeggers and visitors from the United States. Trade has passed it by for Vancouver. By bringing the Canadian Northern right into their city as its terminal point the Victorians see their chance of holding their own against Vancouver on the one hand and Prince Rupert on the other. The Canadian Northern in Nova Scotia, Quebec, Ontario, Manitoba and elsewhere has received the guarantee of the Dominion government, or one or other of the various provinces for its construction bonds, and the same will now be expected from the province of British Columbia for bonds to be issued for the extension from the Rocky Mountains to the coast. Among members of the legislature the feeling appears to be that the guarantee of the province should be given for the extension, but only on the condition that the Canadian Northern shall make Victoria, the capital, its terminal point.

There is much to be said in favor of Victoria as a shipping port as compared with Vancouver, and it is only four miles from Esquimaux, which, until recently, was garrisoned by British soldiers as the depot of the British fleet in the Northern Pacific. Esquimaux has now passed into the hands of the Canadian government and is garrisoned by men of the Canadian permanent force. The harbor is a good one and perfectly sheltered and the government would probably be perfectly willing to grant its use for general shipping. Were that so, Esquimaux, with a clear run out to the ocean, would probably be the most useful and best patronized harbor on the Canadian Pacific coast. A steam ferry between the mainland and Vancouver island at Seymour narrows offers no difficulty, though in getting down to the narrows there would be some very heavy rock-cutting. Something like a generation ago Sir Sandford Fleming made a report on bridging the Seymour narrows, and again about three years ago an officer of the Canadian government made a similar report. The estimated cost was a sum of not less than \$25,000,000! People in Canada talked, then, both of bridging these narrows on the Pacific, and tunneling under the straits of Belle Isle on the Atlantic coast, but a change has come over the spirit of the dream of large expenditures by a population of less than six and a half million people, and that bridge is not likely to be built just yet a while.

The Canadian Northern is apparently in no hurry to reach the Pacific coast, and it will be at Churchill on the west coast of Hudson bay long before it emerges from the Yellow Head pass into British Columbia. It will also probably be at the Athabasca landing, north of Edmonton, in a short time. From this point there is water communication into the great Peace river country, which is now beginning to attract settlement, and which is estimated to be capable of supporting a white population nearly as large as that of the prairie provinces, Manitoba, Saskatchewan and Alberta, when all of them come under occupation, agricultural or pastoral. The route from the Yellow Head pass to Butte Inlet is said to be rich in its possibilities of traffic, a point that has hitherto been very carefully studied in mapping out all the Mackenzie and Mann lines. In the original Canadian Northern, from Port Arthur westward, there is hardly a mile of the road that does not contribute its share to the general volume of traffic, and when the Pacific coast end comes to be built, it will probably maintain the reputation of the rest of the system in this respect. Towards completing a transcontinental

line, and linking up the Canadian Northern, the Canadian Northern Ontario and the Canadian Northern Quebec railways, the gaps now to be filled in are from Ottawa to French River, Sudbury to a point on the main Port Arthur line, and finally the Pacific coast section.

#### THE GOVERNMENT AND THE INVENTORS.\*

Of the hundreds of descriptions and plans of devices or systems for the promotion of safety in railway operation examined by the board so few possess any merit that it is evident that a large proportion of the inventors or proprietors of such devices are entirely unfamiliar with the conditions to be met in railroading, the development of safety appliances, the state of the art of signaling, and often with well known natural laws. This is manifested in three forms:

(1) In devices which, no matter how well designed or constructed, would be dangerous or of little or no value.

(2) In devices or systems which, no matter how well the details of design and construction were carried out, are fundamentally wrong in principle.

(3) In devices or systems which, while theoretically useful and workable, are designed without regard to the well known properties of materials or a consideration of the quantitative values of the forces and velocities involved.

**Dangerous Devices.**—As an example of the first class may be cited the highway crossing gate designed to be closed automatically by the approach of a train. It is obvious that such a device, no matter how perfect in operation, would be unsafe to use as the gates would descend or close when the train was within a given distance of the crossing, irrespective of whether or not pedestrians or vehicles were on the crossing, thus preventing their escape from the very danger that the invention is intended to avert. Other inventions of substantially the same class are those for the automatic throwing of switches by train approach, especially those intended to restore to the main track position by the passage of the train itself a switch that has been maliciously or carelessly left set for a siding or turn-out.

The board believes that switches, being movable portions of the track, are so subject to obstruction of their proper movement by foreign substances, such as stones, lumps of coal, snow, ice, bolts, nuts, and other parts dropped from cars or locomotives, that they should not be operated except by an attendant, for the reason that such attendant can detect abnormal or unsafe conditions which would prevent the proper operation of the switch. These conditions can not be detected by automatic apparatus controlled by approaching trains except under conditions where the throwing of the switch, the locking of the switch, the releasing of the signal, the clearing of the signal, together with the necessary approach and detector locking, are all independent and occur in proper sequence. Even with such refinement it is considered doubtful if the reliability of operation of such devices would be sufficient to warrant their use in practice unless in special or unusual cases.

**Devices Wrong in Principle.**—The most typical devices of the second class referred to, namely, those that are wrong in principle, are signals that require the application of power to move them to the position to indicate "stop," and assume the "proceed" position by gravity or whenever the application of power to them ceases. Within this class falls also the large number of electrical appliances designed to operate on the so-called open-circuit principle. In these, the presence of electric current in the operating devices is required to give a "stop" indication or apply the brakes or accomplish the purpose for which the device is designed; whereas it is evident that all such appliances should be constructed on a principle directly opposite, namely, the closed-circuit principle, so that

if the current supply should fail or a wire should break or become disconnected, or a short circuit or a cross should occur, the "stop" indication would be displayed or the brake applied, or other purpose of the design carried out. In other words, all devices or systems must be to the highest degree self-checking of their own failures, so as to render them as nearly as possible incapable of falsely indicating safety when danger exists, or if used in train control, incapable of permitting a train to proceed when it should be stopped. This principle is fundamental and no devices or systems designed on the contrary or open-circuit principle can be approved.

**Impracticable Devices.**—In the third class, or impracticable devices, we find many where it is intended to operate signals or mechanical trip train stops through the medium of cables or rods several thousand feet or a mile or more in length attached to treadles or other trips which are intended to be depressed or moved by engagement with some part of another moving engine or train, little idea evidently being entertained by the inventor as to the inertia of the parts, the effects of impact, the elasticity and strength of the materials employed, or the conditions due to accumulation of snow, ice, or sand.

**Reliability.**—Next to safety, reliability is the most important feature in safety appliances. By this is meant infrequency of failure of the device or system to respond to all the conditions under which it should act. For example, if a signal device indicates a clear track when the track is obstructed it is an unsafe device. If it indicates danger when there is no danger it is not reliable, and such unreliability soon becomes a source of danger, for if a signal, for example, frequently indicates "stop" when the conditions are all right for the train to proceed, its "stop" indication soon becomes discredited as a true indication of danger and may come in time to be disregarded even when correctly given, and hence lead to disaster.

**Contact Devices.**—Many devices or systems have been examined in which contact plates or rails are included in electric circuits carrying current which either continuously or intermittently is intended to be picked up by a contact brush or shoe on the moving vehicle. While a number of such systems are designed on theoretically correct principles, the practicability of making or maintaining a reliable contact can be determined only from long-continued experiment with various forms of roadway and vehicle contacts under such conditions of speed, vibration, clearance, shock, snow, and ice, as exist in actual railway working in all localities and at all times of the year. In considering any closed circuit arrangement which makes use of a continuous contact rail it must be borne in mind that a momentary loss of contact which might occur from very slight accidental circumstances might in an automatic train-stop device cause an emergency application of the brakes while running at high speed. This makes the reliability of such schemes extremely doubtful.

**Equipment and Structure Clearances.**—Inventors or designers of cab signals and automatic train stops often disregard the very definite relations that must necessarily exist between the dimensions of cars and engines and those of platforms, bridges, tunnels, road crossings, and other structures along the roadway. It should be remembered, for example, that the location of end ladders on freight cars must be definite and reasonably uniform in order to make their use safe for trainmen. Yet many devices of the overhead type are presented, by the use of which freight trainmen, would undoubtedly be subject to more danger than the use of the devices would prevent. The question of equipment and structure clearances should be carefully studied by all who approach this problem.

**Continuous Track Circuit.**—A number of block signal systems have been presented for the board's consideration which involve the use of much complicated apparatus and would doubtless cost as much to install and maintain as the best known systems now in use, and yet lack the very desirable protection afforded by the use of continuous track circuits with their ability to detect broken or removed rails.

\*From the annual report of the Block Signal and Train Control Board to the Interstate Commerce Commission of the United States. For other parts of this report, see January 15, page 116.

This is a protective feature free to be used by anyone as far as patent rights are concerned, and it is especially desirable in view of the relatively poor quality of most of the steel rails now on the market.

**Complaints.**—No small portion of the correspondence of the board has had to do with complaints and demands for an investigation of alleged suppressions of important inventions by powerful corporations and associations to the serious detriment of the public interest and great pecuniary harm to individuals. The nature of the charges made indicates a necessity for investigation to determine whether they are justified in fact, it being considered equally important from the standpoint of the public to establish definitely that such accusations are untrue as that they are true.

There appears to be a very general belief that the inventor without means or influence can not get his inventions considered by railway officials, and in consequence appeals by such inventors to the government for aid to secure what is believed to be his rights have been both frequent and insistent.

The legislation under which the board acts, while providing the machinery for investigating the use of and necessity for block-signal systems and appliances for the automatic control of railway trains and other appliances or systems designed to promote the safety of railway operation, does not provide for the investigation of alleged suppressions of inventions, although it does indirectly aid the inventor without means or influence to get his invention considered when it has been found to possess sufficient merit to warrant a favorable report by this board.

It is believed to be in line with good public policy to provide means to satisfy the insistent demands for just treatment of the inventor, if such means do not already exist, and if they do, then to point out the way to make such means available and effective so as to satisfy the reasonable demands of the complainants.

**Protests.**—Another fruitful source of correspondence has been the protests of inventors on whose apparatus the board has felt obliged to report adversely, and it is interesting to note that not infrequently the most vigorous protests come from those whose devices have been found to possess a minimum of merit. This is largely due, it is believed, to a lack of knowledge of the technical requirements of modern railway operation. In a number of instances the inventor, on having the faults of his system pointed out, has attempted to correct them and has then resubmitted his plans with corrections for further consideration. In a few instances this has led to a favorable report. It is believed that should inventors of railway safety appliances avail themselves of the knowledge and experience of those skilled in the art, a much larger proportion of devices would be found to comply with practical railway requirements.

In a few instances where, on account of fundamental faults in a system, the board has reported unfavorably, the inventor or proprietor has insisted on a practical test of his device notwithstanding, claiming the right to such a test under the appropriation act accompanying the joint resolution under which the board was created. The policy of the board in such cases was defined by the commission in a case referred to it for consideration as follows:

If \* \* \* satisfied \* \* \* that this plan or method of train control to prevent accidents is inherently defective and could not on that account be prudently adopted, we are of the opinion that you are justified in declining to expend the time and money which a test would involve. A device which in the end must be rejected as fundamentally deficient would not seem to require a test for the purpose of demonstrating its lack of practical utility.

**Reports.**—The board has felt it to be necessary in considering devices to be particularly careful in reporting on the same not to mislead or unduly to encourage the inventor or proprietor, who, if encouraged, might enlist capital in a venture the results of which are likely to prove fruitless. At the

same time, the board has aimed to encourage the development of promising devices when it is believed that a test of the same would add materially to our present knowledge and aid in determining the availability of different features for practical use.

Among the more recent developments which are engaging the attention of those interested in the subject of railway signaling are alternating current track circuits for electric roads, working without the use of insulated joints or inductive bonds, the transmission of signal indications by Hertzian waves or other oscillatory impulses, and the production of effects upon moving vehicles as the result of conditions existing upon the track by magnetic or inductive effects without mechanical or electrical contact, involving even such principles as the non-magnetic properties of manganese steel rails.

#### IMPROVING FREIGHT SERVICE ON THE NORTH WESTERN.

The Association of Transportation Officers of the Chicago & North Western has adopted a plan for the reduction of claims for loss and damage to freight. The plan adopted was formulated and recommended in a report by a committee composed of R. C. Richards, General Claim Agent; S. M. Braden, General Superintendent Lines West of the Missouri river; J. G. Quigley, Superintendent Ashland Division; W. Walliser, Assistant Superintendent Galena Division, and A. W. Towsley, Assistant Superintendent Wisconsin Division.

The number of claims and the disbursement made in settlement thereof, has, during the last ten years, increased alarmingly, as it has nearly everywhere. The cost per 1,000 ton miles for settling loss and damage claims for the years named was as follows:

1898.....	.02307	1905.....	.07210
1902.....	.04149	1906.....	.06261
1903.....	.06226	1907.....	.08805
1904.....	.08058	1908.....	.1332

If the claims of 1908 could have been settled on the same basis as in the year 1905 (.07210), the amount would have been \$348,750.65, instead of \$644,407.64, or a saving of \$295,656.99; or, approximately, 90 per cent. less.

The recommendations of the committee, as modified and adopted, are as follows:

"1. Increased supervision to see that employees are familiar with and comply with the rules and to generally supervise the receiving, waybilling, transporting and delivery of freight; and in order that this be properly done and to see that the employees are familiar with and comply with the rules, we recommend an experiment on the Galena, Wisconsin, Iowa and Madison divisions, on which the traffic is heaviest, and on which about 50 per cent. of the loss occurs, in the way of increased supervision by the appointment by division superintendents of additional trainmasters, whose duties it shall be to especially superintend the handling of freight and who shall be paid \$150 per month and their actual expenses and who shall report to superintendents, as follows: Wisconsin Division, 2 men; Galena Division, 2 men; Iowa Division, 2 men; Madison Division, 1 man.

"That there shall also be employed on heavy way freight trains two men whose duties it shall be to load and unload and properly stow freight on such trains and that the conductor shall be responsible for the proper handling of freight.

"We strongly recommend that the superintendent, as far as possible, select the entire train and engine crew on way freight trains on his division and that changes in personnel in this service be avoided as far as practicable.

"That such competent persons as are necessary be appointed at such stations as Wood street, Sixteenth street (Chicago), Fortieth street (Chicago), Grand avenue (Chicago), State street (Chicago), Milwaukee, Des Moines, Omaha and Cedar Rapids, as inspectors, or chief inspectors, whose sole duty shall be properly to supervise the loading and unloading of freight, to examine each car of merchandise as it is loaded

to see that its contents are properly and securely stowed so as to stand ordinary handling, and to see that freight is properly crated and marked.

"When loss and damage occurs which is caused by carelessness or failure to comply with the rules, that this be immediately investigated by the assistant trainmaster and proper discipline administered.

"That the Claim Department furnish each superintendent monthly with a statement showing the amount charged out to his division in the payment of claims.

"2. Familiarizing employees handling the traffic, as to the rules of the company regarding the transportation of freight (which rules we think amply cover the matter). We believe that all such employees should be furnished with a copy of the book of rules known as G. F. D. 26600, and that when they are appointed to a position in which the necessity of a knowledge of such rules is evident, they be required to pass an examination to demonstrate their fitness, the same as enginemen and trainmen are required to pass an examination in the rules of the operating department.

"3. Administering proper discipline when freight is carelessly handled and the rules are not complied with; and that a record be kept which shall inform the division officers and the management of the company, not only of mistakes and carelessness, but also of good service \* \* \*

"4. Provide a schedule for the districting of cars loaded with way freight and adhere to the plan regardless of tonnage, being careful to so arrange the schedule as to produce the necessary flexibility to care for large or small tonnage of business.

"5. Reduce the tonnage now loaded in merchandise cars hereafter, to carry freight without damage, especially cars carrying way freight and district cars, mentioned in our fourth recommendation.

"6. Procure uniform, through waybilling on interline shipments; thereby doing away with the chances of making mistakes in rebilling consignments, as well as saving the cost of making hundreds of thousands of such waybills per year, and furnish a waybill of a distinctive color in forwarding astray shipments, and when such a bill is made, send a carbon to the superintendent of the division in order that he may have some knowledge of the number of shipments passing over his division, and, if possible, locate the cause of the freight going astray and take steps to prevent its recurrence.

The monthly report proposed in the last paragraph of the first recommendation divides all commodities into 18 classes, as follows: Boots and shoes; clothing, dry goods, notions, etc.; grain; candy and crackers; live stock; flour; fruits, vegetables and melons; furniture; junk; household goods; machinery and castings; meats and packing house products; stoves and car linings; tobacco and cigars; sugar; eggs, and miscellaneous.

These titles constitute the headings of the columns, and the losses and damages in each column are classified as follows:

1 Loss of Entire Packages	12 Damage due to Defective and Improper Packages
2 Loss from Packages	13 Damage by Train Accidents
3 Loss from Bulk Shipments	14 Damage Account Delay
4 Loss from Leaky	15 Damage by Defective Equipment—Leaky Roof
5 Concealed Losses	16 Damage by Rough Handling
6 Other Losses	17 Damage from Other Causes
7 Visible and Located Robberies	18 Concealed Damage
8 Failure to Seal and Take Record	19 Lack of Refrigeration
9 Error in Billing	20 Failure to Properly Heat Cars
10 Error in Receipting	21 Unfit and Unclean Cars
11 Error in Delivery	

Total Loss

Total Damage  
Total Loss and Damage

The report can also show the number of claims located at the principal stations, and there is space for the amounts paid out on these located claims.

Some causes of the increase in loss and damage claims as given by the committee are: Lack of interest by employees; lack of knowledge of the rules; failure to comply with the rules when known; failure to check property before receipting for it; receipting for more than is actually delivered; receipting for property in good order when it is in bad condition; giving

clean receipts for property loaded by shipper and not checked by us; failure to properly check freight when delivered to the consignee; failure to promptly and properly report shortages, damages and overs; failure to promptly and properly notify consignees of the arrival of freight and keep a record of such notice; making greater advances on property than its value warrants; delivering property to persons other than the consignee without proper order; mistakes in billing caused by failure to compare waybills with shipping instructions; forwarding freight not marked with name of consignee and destination; improper loading, stowing and bracing freight; loading freight in leaky or dirty cars, etc.; carelessness in taking and transmitting verbal shipping instructions—especially on the telephone; improper use of air brakes; failure to give prompt notice of refused and unclaimed freight; failure to properly ice cars in warm weather and heat them in cold, etc.

### BENJAMIN HICK'S LOCOMOTIVES.

(Illustrated from the Original Drawings.)

BY HERBERT T. WALKER.

In the earlier days of the Liverpool and Manchester Railway, when transportation by steam was still in the experimental stage, the firm of Rothwell, Hick & Rothwell, mechanical engineers, were doing a prosperous business at the Union Foundry, in the ancient city of Bolton-le-Moors, Lancashire. This district is classic ground in the history of the development of cotton machinery—the mule, the frame, the jenny, the carding engine—and within its borders the products of Arkwrights and Hargreaves' genius first saw the light, only to be destroyed again and again by mobs of furious workmen, who regarded machinery as nothing else but ruination to their hand labor. But in Benjamin Hick's day comparative peace reigned, and the British workman had begun to understand that machinery was not his enemy, but a friend, and, in fact, the only means by which he could earn a living.

In the early thirties, the Union Foundry was doing its full share in the production of cotton machinery, stationary engines and locomotives, and Benjamin Hick was in the front rank of his profession, although his name is not prominent in history, for he belonged to that large class of practical engineers, who, although not originating anything particularly new, did much to develop and perfect the high speed steam engine as we have it to-day. He was in close touch with John George Bodmer, the inventor of the balanced engine. Bodmer had hired shop room and power at the Union Foundry, where he built his first double-piston balanced stationary engine in 1834. As far as the present writer knows, Benjamin Hick was the only engineer to recognize the importance of this invention and to encourage Bodmer to proceed in its development; but, at that time no one could be brought to see the advantages of a more uniform rotative effort, due to an engine having a plurality of cranks or turning points, and balanced locomotives were not built until about 10 years later. Hick himself patented a three-cylinder locomotive in 1834, but there is no evidence that an engine on this plan was ever built.

Rothwell, Hick & Rothwell built at least seven locomotives for the United States, one of them being the "Pioneer," built in 1832 for the Petersburg Railroad, a drawing of which was published in the *Railroad Gazette*, of April 12, 1901, page 251.

About 1833, Hick retired from the above firm and founded the Soho Iron Works at Bolton, under the name of Benjamin Hick & Sons. Here the construction of locomotives was continued, many engines being built, including five for the United States during the years 1834-37. Hick designed and constructed for the Soho Iron Works the then most powerful hydraulic press in the world, which was made use of by James Nasmyth (the inventor of the steam hammer), who was indebted to Hick for his practical help in designing and building the machinery for the Bridgewater Foundry. Nasmyth acknowledged that Benjamin Hick was a man whose judgment

in all matters connected with mechanical engineering was held in the very highest regard. In 1848, when Faraday called on Nasmyth to furnish for one of his lectures at the Royal Institution some striking example of the power of machinery in overcoming the resistance to penetration in the case of some such material as cold malleable iron, a slab of steam-hammered malleable iron five inches thick was placed in Hick's press and

The cylinders were 13 inches diameter by 18 inches stroke. Driving wheels, 66 inches diameter. The throw of the outside cranks was one inch longer than that of the inside cranks. The wheels were cast iron, with wrought iron tires. There is a note in Benjamin Hick's papers that he took out the "Soho" for the first time on November 21, 1834, and that the engine worked very well. It ran on a short railway which connected Bolton with Kenyon junction on the Liverpool and Manchester Railway. The Bolton and Kenyon road came into existence under rather peculiar conditions, for there were two separate companies, although the total length of the two lines was

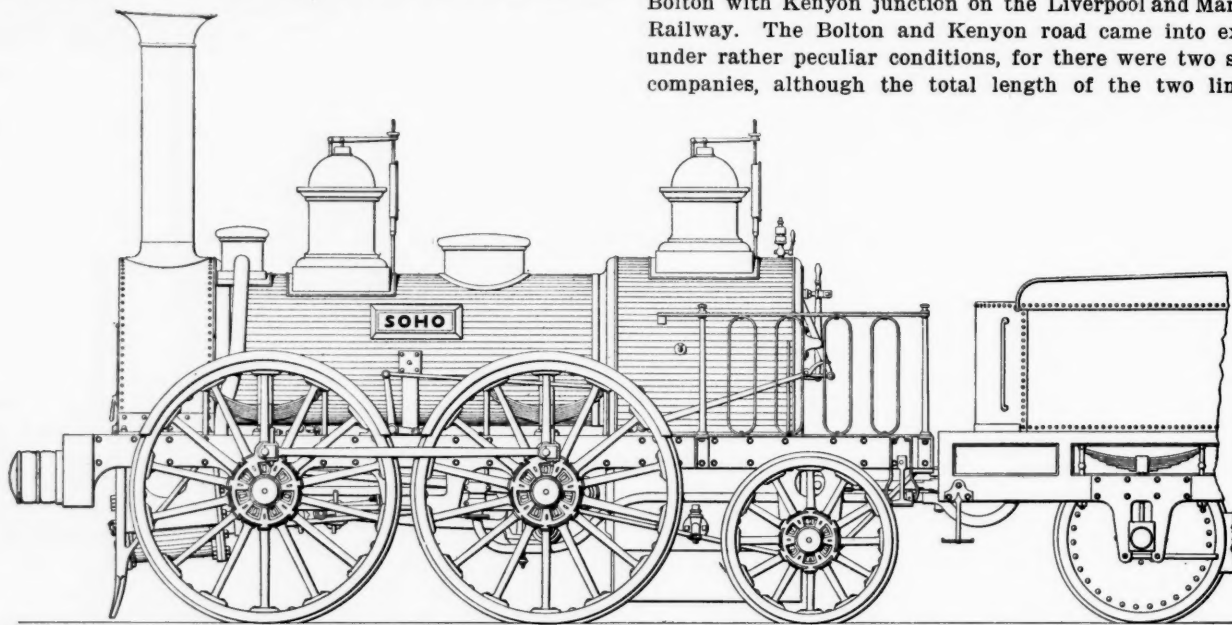


Fig. 1—Freight Engine; Boston & Kenyon Railway, 1834.

the punched slab, together with the punched out disk, were sent to Faraday. Such a matter would be of no interest to-day, but great was the wonder of the Royal Institution audience when the punched plate was placed upon the lecture table.

About 1845, William Hargreaves, a relative of the inventor of the spinning jenny, joined the firm which was then re-organized as Hick, Hargreaves & Co., which title it has since

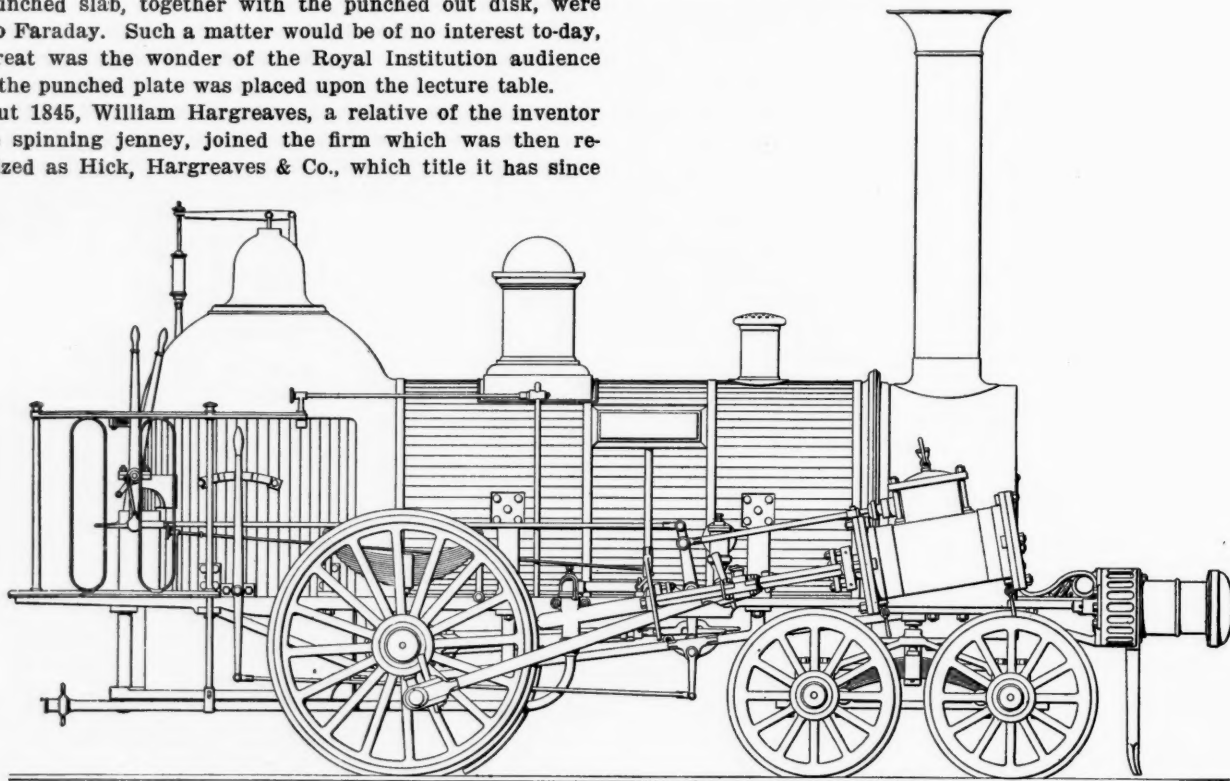


Fig. 2—Engine for the Lickey Incline; Birmingham & Gloucester Railway, 1840.

retained, and the writer is indebted to the present members of the firm for the use of a few of the original drawings of Benjamin Hick's locomotives, and reproductions of three of them are presented herewith. John Hick, Benjamin Hick's son, made these drawings, and drove every engine on its trial trip. Fig. 1 shows the "Soho" freight engine, built in 1834. It is a rare example of a British engine, with outside steam pipes.

only 9¾ miles. On March 31, 1825, the Bolton & Leigh Railway Co. obtained an act to build their line, which they did on the understanding that the Liverpool and Manchester Railway would pass through Leigh, according to George Stephenson's original plan. The Liverpool and Manchester bill was defeated in 1825, but a new bill was introduced in the following year, proposing a more direct route, which would pass through

Kenyon,  $2\frac{1}{2}$  miles south of Leigh. This left the Bolton & Leigh road stranded, so that a link had to be supplied, and a new company was formed and obtained an act in 1829 to build a line from Kenyon to Leigh. The former was opened August 1, 1828, and the latter on January 3, 1831. The two roads were laid with fish-bellied rails, 35 lbs. to the yard, and ballasted with small coal. The grades were rather steep, averaging 1 in 42, and the line was partly worked by stationary engines. In 1840 the combined companies had 14 engines, Hackworth's celebrated "Sanspareil" being one of them, and some of the trains worked through to Liverpool. In 1845, these roads and the Liverpool and Manchester were amalgamated with the Grand Junction Railway, which a year later joined the Manchester and Birmingham to form a part of the present London and North-Western system.

Fig. 2 shows an engine built by Hick & Sons in 1840 for the Birmingham & Gloucester Railway, which is now a part of the Midland Railway, and the present writer is indebted to Mr. R. M. Deeley, locomotive superintendent of the latter road, for a list of the original Birmingham & Gloucester engines, which has been useful in preparing these notes.

The Birmingham & Gloucester Railway, which was opened in 1840, had a steep gradient called the Lickey incline, the rise being 1 in 37. When the engineer, Captain Moorsom, applied

claimed that the actual boiler pressure was over 100 lbs., which accounted for their hauling capacity. It is possible there was some truth in this assertion, for the present writer has been informed by old American engine-drivers that at least one firm, in order to acquire the reputation of building "smart" engines, constructed their spring balances in a way so that when steam was blowing off, the actual pressure in the boiler was far above that to which the index was set, and that some explosions resulted from this reprehensible practice. However that may have been, the Norris engines filled the requirements, but by a narrow margin, and it was soon found necessary to double-head the trains or use one engine as a pusher. A correspondent in the *Railway Times* of November 28, 1840, complained that two of the Norris engines were required to haul passenger trains of only 4 or 5 coaches up the Lickey incline, and wondered if horse traction would not be cheaper. The *Worcestershire Chronicle* of March 3, 1841, had the Birmingham & Gloucester Railway report for the previous year, in which it was stated that the company did not intend to have

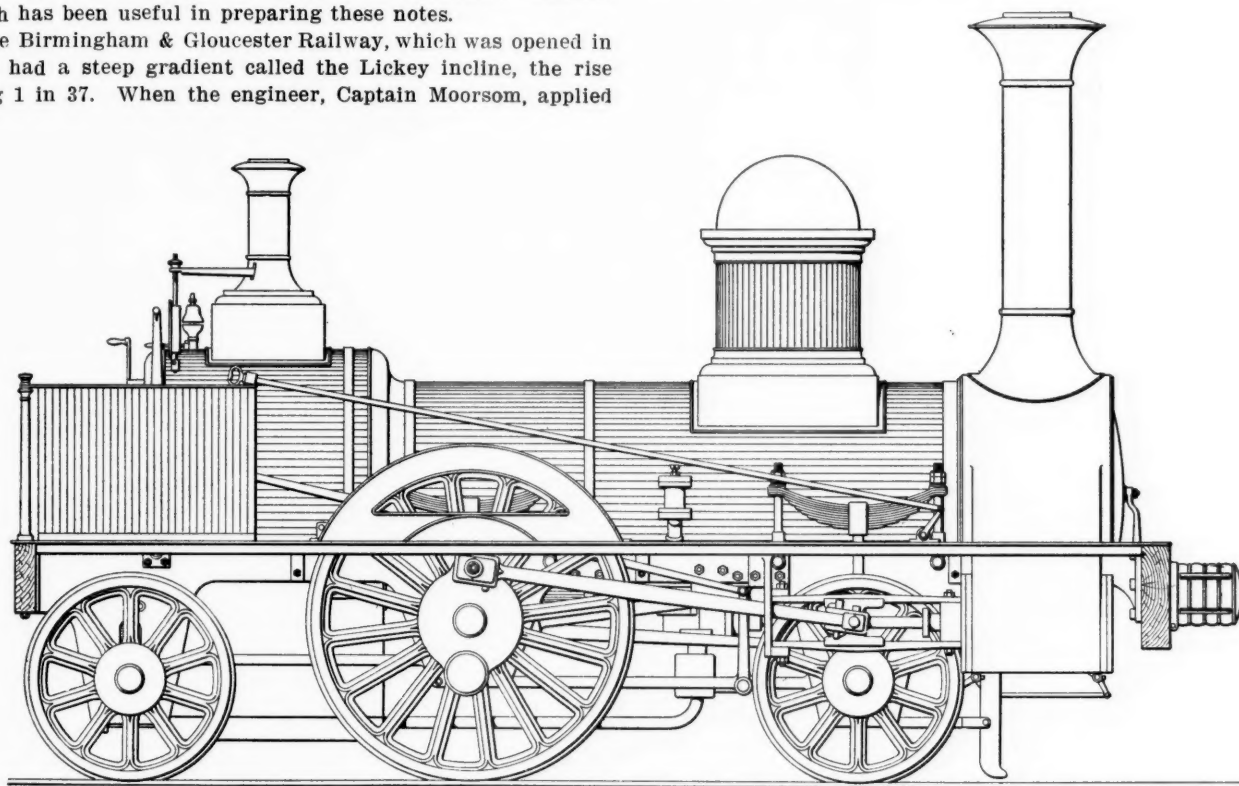


Fig. 3—Express Engine; Edinburgh & Glasgow Railway, 1847.

to British builders to furnish the motive power, they declined to undertake the contract, and Captain Moorsom, who was familiar with the working of American locomotives, placed an order with William Norris, of Philadelphia, who built altogether about 16 engines for the road in question. They were of the well-known Norris design, having outside inclined cylinders, a leading truck, and a pair of driving wheels in front of the fire-box. The cylinders were variously  $10\frac{1}{2}$  inches diameter by 18 inches stroke, and  $12\frac{1}{2}$  inches diameter, by 20 inches stroke. Driving wheels, 48 inches diameter. Weight about 21,500 lbs.

Captain Moorsom had previously visited the United States and was favorably impressed with American engines, hence his prompt action in placing an order with Norris when he found that British builders, through want of energy or progressiveness, were unequal to the occasion. This proceeding brought him much trouble, for, of course, the American locomotives were sharply criticized by British engineers; but they had a few champions, headed by Captain Moorsom. The working pressure of the engines was 62 lbs. on the inch, but the critics

any more American engines, and that locomotives were then being made in England for the company on the same construction as Norris'.

It appears that about nine engines were so built, six by Nasmyth and three by Hick, one of the latter being shown in the accompanying engraving already referred to. A memorandum of Benjamin Hick's reads as follows: "April 20, 1840, John went to Birmingham to take particulars of engines for the Birmingham & Gloucester Railway, from designs by Captain Moorsom." These Hick engines of the American pattern were named "Breedon," "Spetchley" and "Eckington." The principal dimensions were: Cylinders,  $10\frac{1}{2}$  in. diameter by 20 in. stroke. Driving wheels, 48 in. diameter. A further note by Benjamin Hick, dated October 29, 1840, states that "John took the 'Breedon,' one of the Birmingham & Gloucester engines, to Birmingham."

It will be seen that Captain Moorsom followed the Norris design very closely, the working parts, especially the drop-hook motion, being distinctly American. Some of the other

parts are of the English cut, such as the spring buffers, smoke-stack, Hick's standard lock-up safety-valve, with perforated cover, and sand dome—which was doubtless liberally drawn from on the Lickey incline. The spring buffers, which were uncommon in the year 1840, would seem to indicate that these engines were used as pushers.

Altogether, it is not seen why these engines should work any better than Norris', and it is probable the latter were generally satisfactory, and that Captain Moorsom desired to perpetuate the design, but gave the orders to English builders on more or less patriotic grounds.

Fig. 3 illustrates an express passenger engine built by Hick & Sons in 1847 for the Edinburgh & Glasgow Railway. The cylinders were 15 in. diameter by 22 in. stroke. Driving wheels, 66 in. diameter. The trailing axle boxes had a transverse spring.

The Edinburgh & Glasgow was opened in February, 1842. For five years it stopped at Haymarket, Edinburgh, 1¼ miles short of the present station. The grades and curvature of this road are favorable, except the Cowlairs incline at the Glasgow end, which has a rise of about 1 in 45, about three-fourths of a mile being in a tunnel. Trains on this incline were originally worked by stationary engines, but in 1843-44 heavy six-wheels coupled locomotives were put in service and worked well, but were found to be too heavy for the track, the rails of which were only 58 lbs. per yard. In 1847, the locomotives were withdrawn from service and the rope traction was resumed. In 1865 this road was amalgamated with the North British Railway Company, which has worked the line ever since.

#### MECHANICAL REFRIGERATION IN RAILWAY TRANSPORTATION.

BY JOSEPH H. HART,

University of Pennsylvania.

Mechanical refrigeration occupies an anomalous position in the railway world to-day, at least in comparison to its development along other lines. It is a recognized axiomatic condition among refrigerating engineers in general that ice can be manufactured and sold much cheaper than it can be harvested and stored and finally transported to market after its production under natural conditions. Thus natural ice under normal conditions is no real competitor of the artificial variety. Its existence in the market to-day is recognized as the result of specially favorable conditions of production, storage, or transportation, or to the fact that the artificial variety is not produced in sufficient amounts to satisfy the demand.

Again, in 90 per cent. of the commercial developments in which ice was formerly a prime necessity, mechanical refrigeration has resulted in its elimination and the substitution of the latter process as more efficient and equally satisfactory for the purposes at hand. This development has been almost universal in practically all modern applications, with the exception of its utilization in railway transportation. In the latter field the necessity of refrigeration in the transportation of perishable products has increased by leaps and bounds, especially in the last few years, and the end is not yet in sight. Again, the recent heavy congestion in the freight departments of many of the railways, and the steady diminution in car-miles per day as the result of modern conditions, only tend to augment the difficulty. In spite of these conditions the great majority of railways still continue to use natural ice and often transport it long distances, and even in the small percentage of cases in which mechanical refrigeration is used, it is for the sole purpose of making the artificial variety, which is then used and often transported for refrigerating purposes in place of the natural product.

Practically no attempt has been made to utilize mechanical

refrigeration directly with the consequent elimination of the ice in the utilization of the refrigeration, and this in spite of the fact that mechanical refrigerating engineers almost as a class believe the problem one of easy solution. The result has been that manufacturers of this class of machinery have come to regard the railways as difficult customers, and have diminished their attempts at new installations, and to a certain extent minimize the difficulties which must be met in this development, and hence do not thoroughly appreciate and understand them.

The railways, on the other hand, have approached the subject from an unbiased viewpoint, but a few unfortunate experiences in attempts at utilizing mechanical refrigerator cars have put them on their guard and have led them to believe that the claims of increased efficiency for mechanical refrigeration should be taken with a grain of salt, or that operative railway conditions were not thoroughly understood and appreciated. The fact of the matter is, that the mechanical refrigerator car is primarily a power plant requiring the best of care and attention for its operation and the maintenance of high efficiency. It is further complicated by the production of mechanical refrigeration, which requires a constant supply of cold water for the efficient operation of the condenser. Again, the minuteness of the unit, from an engineering point of view, has limited the efficiency, in comparison to the larger types, to such an extent that its utilization, even if mechanically perfect, becomes questionable. This is especially the case, in view of the fact that even stationary plants of equal refrigerating capacity have had their efficiency questioned in comparison to the natural process, except under abnormal conditions of operation, such as locality, or extremely favorable power supply. Under the circumstances, therefore, attempts at development of the mechanical refrigerator car have been ill-advised, to say the least.

The railways can well afford, however, to overlook this minor development, and investigate the whole field of mechanical refrigeration with a view to its efficient development in their line, since progress in other fields has been eminently satisfactory, and the difficulties met with here are not insurmountable from a broad engineering viewpoint. The real difficulty lies in the fact that practically all refrigerating engineers are absolutely unfamiliar with railway requirements and necessities, and, on the other hand, the average railway engineer knows nothing about mechanical refrigeration, the various types available, and the conditions for best operative efficiency.

To begin with, let us consider the subject of mechanical refrigeration from the point of view of the railway. In the first place, mechanical refrigeration is not a necessity in the operation of the average railway, as most refrigerating machine manufacturers and engineers seem to think, and they are right in demanding a very great increase in efficiency and convenience to warrant the universal installation of refrigerating plants with their high first cost and large operative expenses, in view of the fact that their operation would be extremely limited in regard to time of service and very variable in regard to load. The time limitation can be well illustrated by the statement that the refrigeration is used only for the transportation of fruits, vegetables and meats, and that this freight is essentially seasonable in character. The variable character of the demand can be shown from the single statement that last season 20,000 tons of ice had to be shipped a thousand miles into California to take care of a 5 per cent. increase in the citrus crop alone, and that this percentage increase was not a simple 5 per cent. increase in crop production, but represented simply the increase in the demand for refrigeration, a service furnished at the option of the shipper, and hence voluntary and very variable in character.

Perishable products are transported with ventilation or icing, or a combination of the two, ventilation alone

being used during the winter months, and the character of the shipment in summer being largely a function of weather conditions and dependent for choice upon the shipper. Icing and ventilation are both used during the summer months. Some commodities require ventilation as well as icing for their best preservation. Bananas take minimum refrigeration, requiring a mean temperature of 68 deg. F., whereas meats often are frozen, and other fruits require temperatures ranging from 34 deg. F. up to normal. Thus the character of the refrigeration, as well as its amount, is extremely variable. Ice has been used with considerable success, but with certain limitations thus far. It does not cool off the commodity quickly enough for its best preservation. Thus experiments undertaken by the National Bureau on shipments of oranges show that these are preserved best at a temperature of about 35 deg. F., and that in iced shipments from California to New York, the fruit often arrives at a temperature considerably over 40 deg. F. The ice has merely retarded the processes of decay, and preliminary cooling only has been going on during the entire time of shipment. Outside of this feature, the use of ice has proved very economical. It can be obtained often at minimum expense from an indefinite number of points along the right of way, if harvesting by the railway is desired, or it can be purchased to best advantage in the open market. Transportation charges are merely nominal, or at rock-bottom prices, and can be neglected if desired. Commercial ice is not a necessity, and very poor grades can be readily used. The peculiarly favorable position of the railways in regard to ice harvesting and freight control is responsible for the hold that natural ice has in this field in comparison to mechanical refrigeration, and is the cause which renders it so difficult of dislodgement. The transportation of the ice may or may not be a distinct source of profit, and a very large amount of money is invested to-day in modern refrigerator cars fitted especially for the use of ice and ventilation under present standard conditions. On the other hand, the transportation of perishable products by this means is recognized as extremely unsatisfactory, both from the railways' and the shippers' standpoint. Car shortage is always a matter of the gravest import and is always present as a serious problem, since the maximum demand is always many times the average working load. Delays in transit are always accompanied by serious loss, and the trouble of reicing under such conditions keeps the railway constantly under strain. The constantly increasing average delay at both ends of the consignment is also another serious problem, and the situation is becoming of graver significance with each succeeding year. Great progress over former conditions has been accomplished by the use of ice, and it has fitted itself into normal railway operation, with considerable dissatisfaction, it is true, but with a degree of certitude never even approached by mechanical refrigeration in this field.

On the other hand, the situation from a refrigerating viewpoint is equally interesting. Commercial ice, that is, clear, solid ice with good qualities, can be manufactured by large-size plants, of a size not abnormal and quite common in commercial work, at a cost of less than 50 cents a ton with continuous yearly operation, whereas the natural product costs nearly twice as much per ton when cost of harvesting, loss in storage, and transportation charges are considered. What is known as commercial ice is not necessary for transportation purposes, and ice to be used in this development can be manufactured at a considerable saving over the figure given. Again, ice itself is manufactured at considerable refrigerating loss and is not necessary for the utilization of the refrigeration, which is used directly in very many developments. In the preservation of perishable products, absence of moisture is fully as important a factor as low temperatures. Melting ice always causes an excess of moisture, and it is only partially removed by the ventilation which is much more than is necessary, with the consequent cut in freight capacity per car in transportation of this character.

It is not too much to say that in this kind of transportation the gain due to icing is often almost compensated by the additional loss due to excessive moisture, and especially is this the case if sufficiently low temperatures are not obtained, as has been found to be the case in the great majority of cases in which pre-cooling has not been carried out. This explains the reason why simple ventilation occupies such a large position in the transportation of perishable products. Reicing becomes of the greatest importance often on account of conditions developed by the melting of the original ice charge and the presence of excessive moisture combined with a comparatively small rise in temperature. In the opinion of the average refrigerating engineer, the use of ice in conjunction with fruit especially is very objectionable, and equally good results would be obtained if means were available to keep the car abnormally dry under all conditions, both of weather and cargo. Sufficient attention has not been paid to this phase of the problem, and it is a particular advantage of mechanical refrigeration, that when used directly without ice as an intermediary, the moisture problem is solved as well, since the moisture is frozen out almost as efficiently as it can be removed by any form of dryer. In cold storage warehouses, brine is cooled by the refrigerating machine and then circulated through pipes in the cold storage chamber. No liquid of any kind comes in contact with the consignment or with the air circulating about this, and what moisture is present in the air is deposited to a large extent on the pipes carrying the cold brine. Cold brine is much more easily transferable and can be handled readily. Whereas it has a considerably smaller refrigerating capacity per pound in comparison to ice, it can be packed much closer and in out-of-the-way places, so that these factors compensate each other to a very great extent. The use of brine is becoming very general in comparison to that of direct refrigeration, on account of its large refrigerating capacity in case of shut-down, and problems connected with its use are thoroughly understood. Mechanical refrigeration is becoming very general, and in any of the standard types possesses great reliability. It is even used to the extent of several thousand tons capacity for the purpose of freezing the moisture out of the blast in iron furnace operation, and under the circumstances it seems inexplicable that it has practically no hold in railway refrigeration.

The situation in the railway world to-day in regard to mechanical refrigeration is about as follows: Until quite recently, fully 90 per cent. of all refrigeration was accomplished by the good old fashioned method of filling a box at one end of the car with ice at more or less irregular intervals or stations. A small portion of this ice was of the artificial variety, but the most of it was obtained wherever possible, and often only when needed. The mechanical refrigerator car was practically dead—a few, not much over a dozen, operated by private interests, were straggling around, their owners almost invariably ready to complain of unjust treatment or biased tests at the hands of the railways or special icing interests. A few commodities, notably the banana trade, had gone in boldly for mechanical refrigeration, and were operating under private interests with marked success. Pre-cooling plants were in a more or less experimental stage, where they still are, although their progress to date seems to warrant their ultimate installation as a general feature in this type of transportation development. Now, it can be said that the railways have become more fully alive to the possibilities of the situation. This has come about through the results obtained in the banana trade, and by means of pre-cooling station, as well as indirectly through certain developments in mechanical refrigeration.

The installation of a series of refrigerating stations throughout the country by the United Fruit Company for the refrigeration of bananas in transit in train-load lots was a step in the right direction, and has presented important economies. The refrigeration of bananas itself is a special

problem, since they are preserved best at a temperature in the neighborhood of 68 deg. F., and a variation of over 10 deg. F. in either direction is accompanied by disastrous results. Moisture is also a much more deadly enemy than usual, so that the use of ice was very objectionable, both on account of the non-control of the temperatures, and on account of the excessive moisture present with its use. Cold air was the refrigerant finally decided upon, with marked success. The installations are in reality a series of pre-cooling stations, the contents of the cars being cooled at one station and then carried on as far as the refrigeration lasts, without other cooling to the next pre-cooling plant. The necessity of heavy ventilation was also one of the reasons governing the selection of this type. In one of these stations large quantities of air are cooled by being carried over cold brine or ammonia piping, and this air is then conveyed through troughs to the train shed, where it is injected through canvas ducts into as many as fifty cars at one time. It takes a comparatively few hours to cool the contents of the cars by this means to the requisite temperature. A final charge of air is then inserted, traps are closed, and the train is ready to go as far as the refrigeration lasts, and often several days' travel exists between stations. Ventilation is necessary, and this cuts down the refrigerating effect greatly, otherwise much longer distances could be covered without re-cooling.

The pre-cooling plant exists in several government experimental stations, in plants under the management of the railways, and in some few cases individual enterprise has developed small ones. Then necessity has arisen from the fact that ordinary icing is inadequate, since many commodities have been found to travel all the way from California to New York before the initial step in preservation, the production of the requisite temperature, had been accomplished. The banana development has not been placed under this class, although it belongs there, because the use of ice is eliminated there entirely, and because air only is used. The average pre-cooling plant is simply a cold-storage warehouse, with facilities for rapid cooling rather than continuous preservation, and often possesses special facilities for cooling in bulk, or for rapid transfer to cars after cooling. No standard type exists as yet. Practically all are different either in minor or more important features. Thus there are plants in which the contents of the car are cooled in position in the car, after which the car is closed, and the ice bunker filled, whereupon it is ready for transportation. The advantage gained by this procedure is three-fold. The contents of the car attain the requisite low temperature for preservation before shipment, and maintain it throughout transit, thus accomplishing a large diminution in the loss entailed during transportation and a great improvement in the character of the shipment at destination, both for selling and further preservation purposes. The cutting down of the duty required of the ice, since it is used only for the maintenance rather than the production of the low temperatures in the car contents, results in a much smaller consumption of this commodity, re-icing becoming practically unnecessary, except under abnormal conditions, and the initial amount as well is much reduced. Again, owing to the lower initial temperature, conditions less favorable for the production of moisture by deterioration of the cargo, exist, and the necessity of much ventilation is eliminated. This acts in two ways, both to cut down the refrigeration loss due to ventilation, and to further increase the capacity of car by rendering available for cargo space which was formerly required for ventilating purposes. The extent to which this latter factor enters can be readily seen from the statement that the standard car for shipping oranges generally contains 384 boxes, the remaining space being required for satisfactory ventilation, whereas with pre-cooling a car can and does carry from 550 to 580 boxes, and does it better and more satisfactorily

than is accomplished under normal conditions. This is a great advantage, but the detention of the car for pre-cooling purposes often takes several days, so the gain is more imaginary than real in its effect on car shortage and total car capacity.

In addition to the car unit pre-cooling plant there have come into existence, especially on the Santa Fe and Southern Pacific in California, a number of cargo unit cooling plants, which operate more satisfactorily in many ways. It has been found that the time required for satisfactory pre-cooling is directly proportional to the size of the package undergoing refrigeration. The chief delay in car unit pre-cooling plants is due to the time required to satisfactorily cool the interior portion of the contents of the car, especially when close packing has been undertaken on account of the advantage gained by this procedure. The chief difficulty in the operation of these plants is in getting men to work at loading in these low temperatures, and in the loss in refrigeration encountered during this latter process. However, the car unit pre-cooling plant possesses the inherent disadvantage of time loss, since lowering of temperature for pre-cooling still further is impracticable without freezing exterior of car contents, so that the cargo unit plant will undoubtedly become the common type except in developments similar to that existing in the banana trade. Pre-cooling plants, as far as their present development is any criterion, can be assumed to have come to stay and this situation undoubtedly presents mechanical refrigeration in a new aspect to the railway world. Two very efficient types of mechanical refrigerating plants exist on the market to-day, both using ammonia as the refrigerating agent. They are known as the compression type and the absorption system respectively, and have had very variable relative efficiencies. The absorption system possesses the possibility to-day of utilizing exhaust steam from other developments in a very efficient manner in its operation, and it will undoubtedly become much more prominent in this field in the future than it has in the past. The problem of suitable distribution of pre-cooling plants by the railways, and their operation by them, or their installation and maintenance by the communities which they benefit, is but in its inception, and is bound to present many additional subsidiary problems before its final solution. The fact that such plants operate only a limited portion of the year in the performance of this duty, and that their cost is such as to require often continuous operation to make them efficient devices, is one of the most significant features of their development.

Undoubtedly, however, this development is along right scientific lines and opens the door for the possible ultimate solution of the perishable freight problem. As has been said, the two systems of ventilation and icing are both in common use, and the latter is only necessary during stated periods. Maintenance of low temperatures, once attained, is now recognized as dependent simply upon insulation, and the time will undoubtedly come, when, with suitable pre-cooling, icing of any kind will be unnecessary, owing to the very satisfactory insulation of the cars in preventing advent of heat into their interior. Suitable devices for the maintenance of satisfactory hygrometric conditions in transit will be the next step in advance. There may, however, be an interim, during which small refrigerating plants, attached next to the engine, and used for refrigerating the entire train in emergencies, or even continuously, will be used, and their development is dependent simply upon the ability of refrigerating engineers to produce a satisfactory unit for this purpose. The single mechanical refrigerator car is undoubtedly an unsound scientific development and much less will be heard of it in the future than has been in the past. Developments of wide reaching significance are scheduled for the immediate future in this field. The entire development cannot be foretold, of course, but the immediate lines are obvious and will lead on to far-reaching changes.

**WORK OF THE PITTSBURGH MERCHANTS' & MANUFACTURERS' ASSOCIATION.**

The Merchants' & Manufacturers' Association of Pittsburgh was organized for the purpose of advertising the many advantages of Pittsburgh as a market, and also to bring about closer co-operation between the shippers and the transportation interests. In pursuance of this policy, it created the position of traffic manager for the purpose of handling the questions arising with the transportation companies.

Among the questions originally suggested for consideration by the traffic manager were those of freight rates and freight claims. Upon consideration, however, the Board were unanimously of the opinion that it would be a mistake for the Association to undertake the collection of freight claims, realizing as they all did that many of the claims were purely "policy" claims; that is, those which might be said were filed more because of the effect on future routing of freight than because of any legal liability. It was also felt that were the Association to handle these claims and be unable to have all of them settled in favor of the various claimants the members of the Association would in time feel as badly towards the Association as they would against the railroad, because the claims were decided against them. While the Association did not take up the question of the legal liability regarding freight claims, it did from time to time take up with the railroads questions regarding the prompt settlement of claims, and in such matters the railroads endeavored to get prompt decisions.

Some inquiry regarding the freight rates clearly indicated that many of the members of the Association were not fairly in touch with the rate situation. For example, on westbound shipments from Philadelphia the first-class rate to Altoona and points west was 38c., while the eastbound rate from Pittsburgh to Altoona was 33c., and it was not felt that the rates were consistent with the mileage. Reversing the situation, however, it was found that the eastbound rate from Pittsburgh to Philadelphia was only 38c., and Pittsburgh could go practically as far East for 33c. as Philadelphia could go West for 33c., so that on eastbound shipments Pittsburgh operated under the same conditions as Philadelphia did on westbound shipments.

In another case attention was called to the fact that the rate to a town in West Virginia was higher from Pittsburgh than from Cleveland, Ohio, and it was felt that this was an injustice, inasmuch as geographically the town was much nearer to Pittsburgh than Cleveland. Inquiry developed the fact that the shortest distance by rail was about 10 miles less from Cleveland than from Pittsburgh. It was also learned that the practice of the Pittsburgh roads was to divide the Norfolk & Western into two groups, and that the rate from Pittsburgh to the eastern group was less than from Cleveland, while the rate from Cleveland to the western group was less than from Pittsburgh. The railroads were willing to name the same rate from Pittsburgh to all points on the Norfolk & Western that was given to Cleveland, but inasmuch as the Pittsburgh manufacturers and jobbers were already shipping a greater tonnage to points in the eastern group than they could possibly hope to sell to cities and towns in the western group, they decided it was to their advantage to continue working under the existing rates. On the other hand, occasionally a classification or rate was found to be unfair, and several such cases were subsequently adjusted. For example, while shipments of bolts, nuts, rivets and washers were made in carload lots, the shippers were required to forward them in boxes, kegs or barrels, the original cost of which was considerably more than the cost of gunny bags, and there was also an extra freight charge for the additional weight. The railroads changed their rules so as to permit the forwarding of these articles in gunny bags, thus saving the shippers about \$40 per car on shipments to Kansas and other western points. The

large differential in the freight rate for wrought and cast iron was overcome, and also lower rates were cheerfully given on leather shipments to Texas; also on other commodities to which attention was called.

The heavy tonnage of the Pittsburgh district, especially on account of the iron and steel business (the iron and steel being shipped not only to all points in the United States, but to practically all points on the globe), had in previous years through competition between various lines resulted in giving to Pittsburgh favorable rates as compared with other iron and steel centers, and after reviewing the situation it was felt that only in exceptional cases would the rates need revision.

On making inquiry to determine why operating under rates equally favorable to those of other jobbing centers, Pittsburgh was not getting its fair proportion of the tonnage, it was found that in many cases the freight from Pittsburgh was reaching destination from 24 to 48 hours later than from other jobbing centers located at an equal or greater distance from Pittsburgh.

The Association then purchased a number of reply postal cards, one-half of which contained a letter to the consignee, and the other half, which was addressed to the traffic manager of the Association, was filled out by the consignee to show what the shipment consisted of, the date of the shipment, the name of the road and station to which delivered, the date of arrival at destination, the number of days in transit, and whether or not the articles and service were satisfactory. Some eighteen or twenty thousand of these postal cards were received the first year, and gave the Association full information regarding the time in transit by the various roads out of Pittsburgh to the cities drawing on Pittsburgh for their supplies.

Where poor time in transit was a rare occurrence, the matter was not taken up with the railroads, but where it was a chronic condition the matter was taken up, and where justified by the tonnage an understanding was had between the Association and the railroads that they would put on through cars, giving service equal to or better than that of other jobbing centers.

Immediately upon the inauguration of this improved service the Association wrote to merchants in the different towns affected thereby, calling their attention to the improved service and to the fact that an additional market was thus opened to them, and inasmuch as the improved service was of mutual benefit to the two cities, asked that they lend their co-operation to secure a sufficient tonnage to warrant the continuance of the service.

In addition, the merchants of Pittsburgh from time to time put their traveling men in the field to solicit business on the strength of the improved service, and in this way,—the railroads improving the service and the shippers co-operating to secure the tonnage to justify the maintenance of the same—they were able to materially enlarge the territory served by the Pittsburgh jobbers.

In quite a number of cases, where outlying cities and towns were served by two or more roads, it was found that jobbers were dividing their patronage among the various lines, and none of the roads had sufficient tonnage to be able to guarantee through car service, but by concentrating the shipments via one line it was possible to secure tonnage sufficient to justify through service and thus avoid handling freight at transfer stations, thereby reducing the cost and at the same time quickening the delivery at destination.

In some cases the tonnage was not sufficient to justify the maintenance of a through car service, and in these cases the merchants were satisfied that they were not entitled to a continuance of the service and it was withdrawn and the cars placed in through service to other points for experimental purposes.

In a number of cases, where the tonnage was not sufficient to justify the maintenance of through car service daily, an

understanding was reached with the railroads by which they agreed to operate such service either every other day or twice a week (and in a few cases only once a week), and on their part the shippers agreed to hold their freight and deliver it to the railroads on the agreed shipping dates. Any delay in forwarding the freight from Pittsburgh was more than overcome by avoiding the delays en route incident to passing the freight through transfer stations. Notwithstanding the restricted dates for shipping, this service was much appreciated by the consignees, in that it assured them of regular dates for delivery and prevented loss and damage to freight in transit, thus enabling them to give better service to their patrons.

Among other things developed in connection with the study of the through car service was the fact that most of the railroads had two or more stations in Pittsburgh which received freight for the same point, and that there was not enough freight at one station to justify through cars and this necessitated transferring it en route, causing a delay of at least 24 hours. To overcome this the shippers agreed to make the deliveries to only one station, thus insuring sufficient tonnage for a through car. This secured for the shippers quick delivery, and increased business, while it materially reduced the expense of the railroad company for handling and the losses en route.

Also it was found that frequently the consignee would report the freight as being 24 or 48 hours late when the railroad would insist that it reached destination on time, and investigation developed that the draymen who had contracted to handle the business for the consignee was not giving it proper attention, and was allowing the freight to lie at the station an unnecessarily long time and cause the transportation company to be charged with bills for delay for which they were in nowise responsible.

In tracing many shipments which failed to reach destination promptly, it developed that they had been poorly packed or (improperly marked, or not marked at all. Upon calling the attention of the shippers to the delay which ensued through this improper packing and marking they renewed their instructions to their people to have the freight properly packed and marked.

Both the merchants and the railroads were agreeably surprised at the results obtained from the improved service. It resulted in the traffic of the Pittsburgh merchants with the several cities and towns being increased anywhere from 50 to 600 per cent. and in some cases, especially in the handling of fruit, the increase in less than carload business and the ability to make prompt and regular deliveries resulted in shipments in carload lots where formerly no sales were made by Pittsburgh merchants in either carload or less than carload lots—the supplies being obtained from other markets.

The results obtained by the through car service, namely, the very material increase in the shipments by the jobbers clearly indicated that the original conclusions of the Association were correct, and that the trouble was not one of rates, but was one of service, and the business materially developed as the service was improved without any change in the freight rate,—but in a large measure, this could only be brought about by close co-operation between the shippers and the transportation companies.

After putting on the through car to one point the tonnage rapidly increased until it amounted to about 18,000 pounds of less than carload freight per day, and one hardware merchant in that town stated that where formerly he had not spent a dollar in Pittsburgh that during the first year of the through car service he bought \$50,000 worth of hardware in Pittsburgh.

At another point the deliveries originally averaged about 8 or 9 days, while the through car service gave third morning delivery. In three months' time the less than carload tonnage had increased from 3,000 to 12,000 pounds per day.

At another point the service was somewhat irregular, being sometimes first morning and at other times when passing through lines and transferred, second morning delivery. The first month the through car service was increased 2,126 pounds per day. The first week one firm started making shipments of fruit in less than carload lots, where formerly no shipments could be made owing to the irregular service. During the second week they commenced making shipments of fruit in carload lots, and have since developed a very desirable business.

Similar results were obtained at practically all other points where the improved service was inaugurated.

The railroads checked up the freight on hand at the local freight houses, and found it was moving very slowly; in many cases the merchants preferring to pay storage charges rather than move the freight away promptly. The attention of the merchants was called to the fact that this resulted in the piling of the freight on the platform to a height of 15 to 18 feet, and that it necessitated handling the freight several times in order to get the particular shipment called for, thus increasing the damage to shipments and very materially delaying the teams at the stations. As a result, the shippers agreed to assist the railroads, and caused their freight to be taken from the stations promptly, thus reducing the cost of handling and the losses at the freight houses, and benefiting the shippers by reason of discontinuance of delays to teams.

The railroads also called attention to the blockading of yards owing to slow loading and unloading of cars placed on team tracks or industrial sidings, and the shippers overcame a great part of this delay.

In connection with the soliciting of business, the merchants of Pittsburgh got up semi-annual excursions, and from 100 to 125 of the merchants would take a five or six day trip, visiting the cities and towns within a radius of 250 miles of Pittsburgh. A special train, consisting of baggage car, dining car, and eight or ten Pullman cars was chartered for the purpose, and stops were made at all important towns en route. Usually they were received at the depot by a committee of merchants, and after an informal reception visited the stores handling their respective lines of goods. Little or no attempt was made to solicit business on these trips, but the merchants were requested when in Pittsburgh to drop in and see the member of the firm who had called on them, and this acquaintanceship resulted in many merchants coming to Pittsburgh.

The Association also got up a series of inbound excursions, and for specified periods agreed to give the incoming merchants a reduction of 1 per cent. on all purchases made. They also made a special effort to see personally the incoming merchants, and in some cases provided some form of entertainment so as to make their stay pleasant and cause them to desire to return in the future.

One thing developed by these inbound excursions was the fact that where the merchants remained at home and made all their purchases from traveling salesmen they endeavored to divide their orders among all the salesmen regularly calling on them, but after the inauguration of the inbound excursion the merchant saved his orders for some time prior to making the trip, so as to take advantage of the much larger selection of goods which could be seen on display in the several stores.

One of the many advantages secured by the co-operation of the shippers of Pittsburgh was in the acquaintanceships formed among the merchants of Pittsburgh, many thus becoming acquainted who had been in business for 20 and 25 years within three or four blocks of each other, but without being acquainted. Following this acquaintanceship, the men joined together in working for the good of the city, and where one jobber could not supply all of the things desired by a customer, he took special pains to see that the customer was placed in touch and under favorable terms with other shippers in the city who were handling the class of goods desired.

## RAILWAY CAPITAL AND VALUES.\*

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The present agitation for a physical valuation of the railways appears to be the result of a misconception on the part of the Interstate Commerce Commission some twenty-one years ago of Section 20 of the Act to Regulate Commerce. Section 20 contains a provision to the effect that the Commission may require the carriers to show in their annual reports "the cost and value of the carrier's property, franchises and equipments." Overlooking the permission thus granted, Prof. Henry C. Adams, statistician of the Interstate Commerce Commission, in his first, and again in his second annual report, after stating that satisfactory and conclusive information respecting the cost of railways in the United States could not be obtained, suggested an inquiry by the government for the purpose of obtaining "a trustworthy estimate of the relation existing between the present worth of railway property and its cost," and declared that "the work thus outlined is indeed a prodigious one."

Subsequently, the desire of Governor Pingree to find a means of increasing railway taxation in Michigan gave Professor Adams an opportunity to experiment with his project within the limits of that state.

In its annual report to Congress for the year 1903 the Interstate Commerce Commission devoted several pages to a discussion of such a valuation as proposed by Professor Adams, concluding with the non-committal recommendation "that Congress take this matter under advisement with a view to such legislative action as may be deemed appropriate."

Physical valuations of railway property have been made, or are under way, in Michigan, Wisconsin, Texas, Minnesota, Virginia and Oregon. The Interstate Commerce Commission made an investigation, in 1900, of the value of railway property as expressed by the market quotations for railway securities, and, again in 1904, in co-operation with the Census Office, prosecuted an elaborate inquiry concerning the "commercial valuation." The latter inquiry was under the direct charge of Professor Adams, and its results are to be found in Bulletin No. 21 of the Census Office. It is, perhaps, dissatisfaction with the results of these inquiries which has impelled the Commission to seek authority to make another and at least equally extensive and costly effort to obtain a valuation by another untried and different method, and in accordance with an entirely different series of definitions.

The first evidence of official interest in this proposal, outside of the office of the Commission, is to be found in a letter bearing the date of March 17, 1906, which President Roosevelt addressed to the Interstate Commerce Commission, as follows:

"It seems to me that it would be a very desirable thing to have a valuation made of the railway properties. I do not know how much time this would take or how much money it would cost, and whether or not there are objections to having it done, or even if it could be done without the action of Congress. At your leisure I should like your opinion on these points."

In reply the Commission forwarded to the President a letter from Professor Adams, recommending an inventory by competent engineers, classifying the physical elements of railway properties, and assigning to each its appropriate present value, such classification to conform to the classification of construction expenses prescribed by the Interstate Commerce Commission. For the valuation of the surplus or franchise value he recommended the plan used by himself in the State of Michigan. It was stated that the prime motive for the valuation would be its bearing upon the work of the Commission in the determination of just and reasonable rates. In this letter Professor Adams gave a year and one-half as the period probably necessary for such a task, and declared that the Michigan experiment cost the people of that state approximately \$5.50 per mile. On the same basis of cost such an

inquiry covering the whole United States would require an expenditure of not less than \$1,750,000 (exclusive of any expenses on the part of the railway).

On December 20, 1906, and again on December 4, 1907, Senator La Follette introduced a bill to amend the Act to Regulate Commerce so as to provide for the determination of the "fair value" of the railways. In the Commission's letter of March 25, 1908, to the chairman of the Senate Committee on Interstate Commerce, it strongly opposed the phrase "fair value," claiming that like the word "reasonable" it involved judicial determination, and therefore was not "exactly suitable as a direction to the official body in charge of this work concerning the manner in which it shall be prosecuted." They suggested the substitution of a phrase, indicating that Congress desired "an inventory valuation of railway property," i. e., that the property of the several railways be listed in detail, and that each kind or class of property so listed shall have assigned to it a valuation to be determined from the point of view of the contracting engineer, and not from the point of view of a court or board of arbitration, which, from the nature of the case, cannot judge of what is "fair value," except in the light of some specific use to be made of the valuation.

It is to be noted that in the correspondence with the President the Commission advanced a specific use to be made of the valuation, while in their correspondence with the Senate Committee on Interstate Commerce, they objected to the determination of the "fair value," as it could only be used in the light of some specific use to be made of the results.

The recommendation of the Commission that the valuation of material in place be ascertained instead of "fair value" is best understood in connection with the following paragraph in the report on valuation of the roads in Michigan:

"Another potent reason justifying the plan selected, as afterwards developed, was the necessity of treating the problem strictly as an engineering problem in order to obtain uniform results. It was necessary to employ a large number of engineers expert in railway work, and while they could agree as engineers they could not agree as experts on taxation. It very soon became necessary to publish an order excluding all thought of taxation in connection with the results to be obtained. The commissioners required of us only the cost of reproduction and the present value of a road, reserving to themselves any adjustments of these values that might be thought necessary to secure uniformity of taxation."

This is tantamount to an admission of inability to secure a valuation possessing sufficient merit to make it useful for a specific purpose.

The plan advocated by the Commission corresponds so closely to that followed in valuing railways in Michigan that a study of the methods followed, and the results obtained in that state will throw considerable light on the larger project, its potential utility or lack thereof. The following allowances were made over the estimated cost of material in place:

Engineering and superintendence.....	4	per cent.
Legal expenses .....	0.5	"
Interest during construction.....	3	"
Organization .....	1.5	"
Contingencies .....	10	"

It should be borne in mind that this valuation was undertaken solely for purposes of taxation. The valuation was obtained in the following manner:

## PHYSICAL PROPERTIES.

(1) The cost of reproduction was assumed to be what it would cost to reproduce the road at the average prices prevailing for the period of the preceding five years, entirely new in every particular. In, say, two or three years' time, if the entire railway were eliminated—its right of way, yards, stations, and terminals passed into other hands and occupied by just such woodlands, waste lands, farms, industries, and residences as those now existing in and on the adjoining country and property.

(2) The present value of the physical properties was assumed to be an amount equaling the cost of its reproduction minus the amount covering the depreciation in value from time, wear, tear, etc.

(3) In determining the land valuation, the land was classified according to population of the country through which it passed, and where possible, there was obtained the average value of property transferred within five years in the section traversed by the road, and to this an allowance was made for damages to adjoining property.

\*An address before the New York Traffic Club.

It was estimated the railways would have to pay from 100 to 125 per cent. in excess of the value as determined by adjacent property.

(4) No attempt was made to take into account the economic value of grades and curves or the absence of them—each road was appraised just as if it was a straight line, and as if its grade line were level throughout.

(5) Industrial tracks were scheduled as the property of the railway company, except where it could be shown that they did not belong to the company, but the right of way and adjacent buildings were not so scheduled unless the railway owned them outright.

(6) The rolling-stock was apportioned on the basis of the annual mileage of locomotives, passenger and freight cars and miscellaneous equipment. Where this could not be done it was distributed on the basis of main track mileage.

The "percentage condition" of rolling-stock was based on an inspection of 50 per cent. of the road's locomotives and passenger cars, and 20 per cent. of each class of freight cars.

(7) To expedite the work and insure more uniform results, a set of tables was compiled showing unit prices for all the different elements.

#### NON-PHYSICAL PROPERTIES.

I cannot do better than quote from Professor Adams' report to the Board of State Tax Commissioners, Lansing, Mich., under date of October, 1900:

"The rule submitted for the appraisal of the immaterial values of railway properties, or what I prefer to term the capitalization of corporate organization and business opportunity, is simple, as follows:

(1) "Begin with gross earnings from operation, deduct therefrom the aggregate of operating expenses, and the remainder may be termed the 'income from operation.' To this should be added 'income from corporate investments,' giving a sum which may be termed 'total income,' and which represents the amount at the disposal of the corporation for the support of its capital and for the determination of its annual surplus.

(2) "Deduct from the above amount—that is to say, total income, as an annuity properly chargeable to capital, a certain per cent. of the appraised value of the physical properties.

(3) "From this amount should be deducted taxes, rents paid for the lease of property operated, provided such property is not covered by the physical valuation made the basis of the annuity referred to under paragraph 2, and permanent improvements charged directly to income. The remainder would represent the surplus which, capitalized at a certain rate of interest, gives the value of immaterial properties."

In justification of the placing of a valuation on the non-physical property, Professor Adams stated in his report:

"It is understood that the object of the investigation instituted by the Michigan Tax Commissioners is to determine whether the properties imposed with specific taxes pay, upon their true value, a rate equal to the rate paid by property taxed under the general tax law. The suggestions here submitted pertain to railways organized as corporations and whose chief business is that of transportation.

"It is submitted that this non-physical or immaterial element is not a simple commercial element, but includes among other things the following:

(1) "It includes the franchise—

(a) "to be a corporation;

(b) "to use public property and employ public authority for corporate ends.

(2) "It includes the possession of traffic not exposed to competition, as, for example, local traffic.

(3) "It includes the possession of traffic held by established connections, although exposed to competition, as, for example, through traffic that is secured because the line in question is a link in a through route.

(4) "It includes a value on account of the organization and vitality of the industries served by the corporation, as well as of the organization and vitality of the industry which renders the service; this value, consequently, is, in part, of the nature of an unearned increment to the corporation."

In Michigan the cost of reproduction, when new was estimated at \$202,716,262, and the then present value was \$166,398,156. The value of the non-physical properties was estimated by Professor Adams at \$35,814,043, making the total then present value \$202,212,199, or \$504,063 less than the estimated cost of reproduction when new, or 0.2 of 1 per cent. It is, of course, evident that the method thus outlined makes the estimate of value of non-physical property wholly dependent upon the rates of interest used. Interesting evidence of this is to be found in the fact that while Professor Adams valued the franchises of the Michigan Central Railroad at \$18,259,880, another economist of equal distinction, Prof. Emory R. Johnson, of the University of Pennsylvania, and a former Isthmian Canal Commissioner, computed the value of the same fran-

chises as \$3,227,000. The methods used in both cases were identical, except as to the rate of interest assumed to be applicable.

There is little, if any, difference in the basis used in the several states for determining the cost of material in place. That basis may, among other things, be criticised as follows:

(1) No allowance is made for discount on securities sold.

Discount is a partial capitalization of the commercial risk had in making the investment, and it increases or decreases in proportion to the probability of the earning power of money under existing conditions. Not only is this practice justified by long-established commercial usage, but also by judicial determination.

(2) The interest during construction (3 per cent.) is less than a fair and reasonable return on the investment.

(3) No allowance is made for working capital with which to carry on the business.

(4) No allowance is made for wear and tear of material during the period of construction. Assuming eight years to be the life of a tie, and three years the period of construction, a substantial percentage of the period of usefulness is over before the road is in operation. The use of the rails before the track is put in proper line and surface hastens the time when they must be removed.

(5) No allowance has been made for impact and adaptation. After the line is placed in operation, each fill will sink 1 ft. for every 10 ft. of height. The slope of cuts must be increased to prevent landslides and washouts. The ballast will pound into the roadbed, necessitating additional ballast to secure a standard cross-section.

(6) A uniform price for earthwork was used, thus ignoring the varying character of the soil and length of haul.

(7) A uniform price list for all materials was used, thus ignoring the source of supply and cost of delivery to point of use.

(8) No allowance was made for interference with work on account of labor troubles, condition of the weather, etc., which would vary materially in the different counties of the same state.

(9) No allowance is made for carrying charges until such time as the road was placed on a revenue basis.

The basis of the valuation of the non-physical property in Michigan is also subject to criticism, namely—no consideration has been given to the leasehold interests. In some cases the leased property is operated at cost, and all revenue goes to the operating company. In others the road is operated at a loss, while in the case of union depot and terminal companies they are usually operated on the basis of cost, and no allowance is made for interest on investment.

Therefore, it will be seen there remain to be determined many questions vitally affecting the value of the property without regard to its value as a "going concern."

There should be no difference in the basis of arriving at the value, as a "going concern," of the property of a railway and any industrial establishment, nor should there be any difference in the basis of valuation for taxation or other purposes. There is common to both the value due to location, good will, etc.

In the case of real estate a corner store will sell for more than the adjoining store, or, if leased, will bring a greater rental, although the two stores may be part of one building and built on the same kind of soil. That there are other intangible values attached to property was shown in the damages assessed in connection with the construction of the elevated railway in New York City. Damages were awarded on account of partial shutting off of light, interference with ventilation, or because of the increased dust and noise. In the manufacturing and commercial pursuits "good will" frequently is considered of greater value than the tangible assets. That it is which gives value to the trade-mark.

(To be continued.)

## General News Section.

The Queensboro (Blackwell's Island) bridge, New York, was opened for pedestrians and vehicular traffic on March 30. No connections for surface or elevated lines have yet been made.

The Strang gasoline electric motor car "Irene," which has been in test service on the Chicago & Alton out of Bloomington, Ill., has been sent to the St. Louis, Iron Mountain & Southern, where it will be used in similar service. This car was described in the *Railroad Gazette*, May 29, 1908, p. 731.

The plans for contract No. 23 on the New York State barge canal from Kingsbend to Rochester, 5.63 miles, and contract No. 30, for locks and other improvements from Little Falls west to Sterling Creek, 14.62 miles, have been approved. The cost of the two contracts is estimated at \$4,900,000.

It is announced in the city of Mexico that the National Railways will at once begin keeping the best possible check on their conductors, with a view to having cash fares properly and fully returned to the treasury; and, as usual, the reporter who goes around among the conductors reports that there is a big stir on the subject. The conductors are threatening to strike, and a grievance committee is to appeal to the higher officers of the road. Mexican conductors, like some conductors in the United States, seem to see no impropriety in thus taking a position which appears to involve approval of stealing. It was in Mexico City not long ago that an effective check was put upon misuse of cash fares by street car conductors by the use of a lottery. Each conductor had to give to the passenger a receipt and the receipt was a ticket entitling the holder to a chance of drawing a large cash prize. Such receipts of course would not be lightly thrown away.

### Lectures at the University of Minnesota.

Edward P. Burch, Consulting Engineer, Minneapolis, is giving a course of ten lectures on "Electric Traction for Railway Trains" at the College of Engineering of the University of Minnesota. The lectures include: History of Electric Traction; Advantages of Electric Traction; Characteristics of Steam Locomotives; Characteristics of Electric Locomotives; Motor Car Trains; Electric Railway Motors; Power Required for Trains; Steam, Gas and Water Power Plants; The Transmission System; Electrification of Railways.

### New York to Chicago in 16 Hours 30 Minutes.

A special train over the New York Central and the Lake Shore, which was run from New York to Chicago last Sunday to carry F. A. Vanderlip to the bedside of his dying mother, traversed the distance of 959 miles in 16 hours 30 minutes, equal to 58.12 miles an hour. The train started from Mott Haven yard, which is about five miles out from the Grand Central station, making the distance through 959 miles, as before stated. The record of the train, condensed, is as follows:

March 27:		Left Cleveland . . . . . 9:27 a.m.
Left Mott Haven . . . . . 11:40 p.m.		Arrived Toledo . . . . . 11:23 "
March 28:		Left Toledo . . . . . 11:26 "
Arrived Albany . . . . . 2:15 a.m.		Arrived Elkhart . . . . . 1:23 p.m.
Left Albany . . . . . 2:18 "		Left Elkhart . . . . . 1:26 "
Arrived Syracuse . . . . . 4:55 "		Arrived Chicago . . . . . 3:10 "
Left Syracuse . . . . . 5:03 "		
Arrived Buffalo . . . . . 7:34 "		*Eastern time.
Left Buffalo . . . . . 6:39 "		†Central time.
Arrived Cleveland . . . . . 9:25 "		

The unusual delays were as follows: Scarboro, to take on Mr. Vanderlip, five minutes; low speed through Poughkeepsie, two minutes; supplying car with water at Syracuse, six minutes; stop at Englewood, to leave Mr. Vanderlip, five minutes. This train, like all others, had to run at restricted speed from Whiting to the Chicago terminus, about 15 miles. The best runs made by the train were from Buffalo to Erie, 88 miles, in 77 minutes, equal to 68.57 miles an hour; and from Toledo to Elkhart, 132 miles, in 117 minutes, equal to 67.69 miles. The train consisted of five cars, weighing about 420,000 lbs.

It was started out of New York on about an hour's notice, and, in the absence of special preparations, such engines had to be assigned to the train as were readily available, and this was the case throughout the run. Only one car was needed, of course, for the passenger, but the other cars were put on to make sure of the best possible brake power.

This is the best run on record for so great a distance, though the regular 18-hour trains have often made up much lost time. Most of the best runs on record are given in the *Railroad Gazette* of December 15, 1905, page 566, and on page 100 of the *Locomotive Dictionary*.

### Proposed Passenger Subway for Illinois Central in Chicago.

Chicago newspapers report that the Illinois Central, in connection with the proposed electrification of its suburban service, has a scheme for a subway in the downtown district of that city. The road has only two suburban stations adjacent to the business district, both on the lake front, and therefore off to one side, necessitating considerable walking on the part of most of the passengers. The plan reported to be under consideration is for an underground loop which would give the suburban trains direct access to the retail stores and office buildings. One account has it that the subway will start at Forty-seventh street, some five miles out from the business section.

This mention of the Illinois Central's plan comes in connection with the publication of the preliminary findings of a municipal commission on the construction of street railway subways in the congested business district, which the papers say will be started within two years. As these subways are to be under all of the down-town streets, the papers, which at first were unable to find any room for the Illinois Central's loop, proceeded to expand the same into a great belt subway to link together all of the railways and in which all would have equal rights, contingent on the prior electrification of their terminals.

Illinois Central officers have declined to be quoted in connection with these newspaper reports, but the need of some such expansion of the road's city facilities for suburban business is becoming constantly more necessary and there is good reason for believing that it is being considered in connection with plans for electrifying the suburban service. The advantage to the road in its competition with the present excellent service of the street and elevated railways would be great and would undoubtedly enable it to regain traffic that it has lost to these competitors because of its present disadvantage in the matter of downtown terminals.

### University of Colorado.

The fifth annual inspection trip of the senior and junior classes of the College of Engineering of the University of Colorado began on March 29. The trip covers the entire week, visits being made to the Minnequa works of the Colorado Fuel & Iron Co., the Portland Cement Company's plant at Portland, and various hydro-electric and steam plants at Shoshone, Leadville and Colorado Springs.

### Responsibility of States for Railway Service.

One of the questions which the nation must soon solve is that of responsibility for railway success or failure. Under existing conditions that responsibility has certainly been taken away from the owners. They are not in full control either of the rates or of the expenditures. Does the responsibility lie with a state commission? If so, with which one, in the case of a road which operates in many states?

In one of the Rock Island states a 2-cent passenger bill was introduced some eighteen months or two years ago, and we were told by those in authority that no opportunity would be

given for the submission of figures or arguments—that the legislature had been elected on a 2-cent rate platform, and therefore the matter was closed. This act was independent of what was done by the railway commission of that state, and regardless of what had been done, or was being done, in all of the other states. If the theory is to prevail that rates shall be so adjusted as to yield a fair and attractive return to the owners, then revenues cannot be reduced piecemeal here and there without regard to what is being done by others who are active in the same cause.

The point I make is this: With the many state legislatures and state railway commissions working independently to so reduce railway revenues that too much money shall not find its way to or remain in the treasuries of the companies, and then add to these factors the right of the Interstate Commerce Commission to reduce interstate rates, and the right of the national congress to increase the cost of operation, who will be responsible if the net results are not such as to keep things moving?—B. L. WINCHELL.

#### Train Robbers at Denver.

On the night of March 24 robbers took about \$400 from passengers in a sleeping car on the Denver & Rio Grande, while the car was standing in the yard at West Denver, only a short distance from the Union station. The car was part of train No. 4, which came in behind time, late at night, and it was set off in the yard so that it would not be necessary for the passengers to disembark until morning. Six of the seven passengers were robbed of their valuables; one, a woman, was allowed to sleep undisturbed, in response to the appeal of her husband.

#### Compromise in Utah Fuel Company Suit.

Attorney-General Wickersham announced at Washington this week that by a compromise of the case of the United States v. the Utah Fuel Company the government recovers \$200,000 for lands fraudulently procured, although the frauds were perpetrated by men no longer connected with its management. The Utah Fuel Company, a subsidiary of the Denver & Rio Grande Railroad, pleaded guilty to the charge of conspiracy to defraud and paid a fine of \$8,000, and also paid back to the United States \$192,000 for the lands unlawfully obtained, 1,440 acres in extent.

The facts that the lands on which this recovery is made had been mortgaged to the Morton Trust Company, of New York, to secure a bond issue of \$2,000,000; that most of these bonds were in the hands of innocent purchasers, and that any decree for the recovery of lands would have been subject to the lien of this mortgage played a part in inducing the government to compromise the case. It is further stated that the individuals indicted with the Utah Fuel Company did not appear to have been guilty of any intentional fraud or to have profited individually by the acts which led to the procurement of title to these lands by the predecessor of the Utah company.

#### John Fritz Medal.

The John Fritz medal for 1909 has been awarded to Charles T. Porter, Hon. Mem. Am. Soc. M. E., for his work in advancing the knowledge of steam engineering, and in improvements in engine construction. The public ceremony of the presentation of the medal to Mr. Porter will take place in the Engineering Societies' building, New York, at 8.30 p. m., on April 13. There will be addresses by representatives of the four groups of the profession most concerned, as follows: "The Debt of Modern Industrial Civilization to the Steam Engine as a Source of Power," by Dean W. F. M. Goss, University of Illinois, Mem. Am. Soc. M. E. and Am. Inst. E. E. "The Debt of the Modern Steam Engine to Charles T. Porter," by Prof. F. R. Hutton, Columbia University, Hon. Sec. Am. Soc. M. E. "The Debt of the Era of Steel to the High-Speed Steam Engine," by Robert W. Hunt, Chicago, Mem. Am. Soc. C. E. and Past-Pres. Am. Soc. M. E. and Am. Inst. M. E. "The Debt of the Era of Electricity to the High-Speed Steam Engine," by Frank J. Sprague, of New York, Mem. Am. Inst. M. E. and Am. Soc. C. E.

#### Business Waiting.

The cut shown below comes from the *Philadelphia Record*, whose artist seems to appreciate the tediousness of waiting on a side track at a lonely way station. No adequate key is published with the picture and the reader will be obliged therefore to interpret the details for himself. The four-story effect which is seen in the view of the freight car does not mean that this is a circus train, with such a large pack of performing dogs that four-deck stock cars have to be used, but rather that every freight car detained by Congressional time-wasting means loss to a four-story woolen mill or shoe shop. The provision of multiple floors in the caboose is a feature to be criticised, for if the business train is to have a dozen conductors, as this would seem to imply, the business world will be in a poor situation to condemn Congress when it allows too many cooks to spoil the broth. The absence of guard rails opposite the frog means, presumably, that the G. O. P.



still feels secure in the favor of Divine Providence, making such little precautions against disaster unnecessary. The short wheel base of the caboose is merely an evidence of the bad luck that business has suffered during the past year; the wheels of the caboose were lost in a wreck, and the truck seen in the picture was borrowed from the wrecking car. The really cheering feature of the picture is the cloud of smoke from the train in the distance. This, by its size and its business-like appearance, indicates that the train is coming over the prairie at the rate of 70 miles an hour, at the very least. If "tariff revision" and "prosperity" are synonymous this little romance should soon have a happy ending. The conductor has got his badge on one-sided, and we are a little bit afraid that the caboose does not clear; the switch is old-fashioned, and such a thing as an up-to-date system of fixed signals appears to be entirely foreign to the thoughts of the management of this railway; but in such little details as these we may safely trust to the Railway Business Association to guard us from all evil!

#### Afternoon Tea on P. R. R. Pullman Cars.

The Pennsylvania Railroad now furnishes tea and coffee free to all passengers in Pullman parlor or sleeping cars at any hour of the day. The passengers will feel as English as though they were on an ocean steamer. This is the way the innovation strikes the *Pittsburgh Gazette-Times*:

"The most stupendous revolutions are those that come quietly. Thus unheralded came a little order issued to Pullman conductors of the Pennsylvania Railroad yesterday, decreeing that henceforth 'tea and coffee will be served in Pullman cars free of charge,' which service is to be performed by the porters, who 'shall not accept from passengers any

gratuities therefor.' This means that the great corporation, the world's model railway, has joined the ranks of those who go about doing good. We should not be surprised to hear the announcement next that bridge tables will be installed, that the company will furnish cards and prizes, and that the porters are to keep the score. A box of caramels for every section is a logical sequence, and bunches of violets are next in order." \* \* \*

#### Southern Association of Car Service Officers.

The semi-annual meeting will be held on April 15 at the Piedmont hotel, Atlanta, Ga. Reports are expected from the Committee on Discussion and Arrangements and the Committee on Interchange, Per Diem and Car Service.

#### Canadian Society of Civil Engineers.

A meeting of the Mining Section was held on April 1. An authorized announcement was made by Dr. J. B. Porter in regard to the manufacture and qualities of Monel metal, followed by brief papers on the metallurgical and physical qualities of the metal, by Dr. A. Stansfield and Prof. E. Brown. Specimens of the material were exhibited.

#### New York Traffic Club.

At the meeting of the Traffic Club of New York on Tuesday evening last a paper was presented by O. P. Austin, Chief of the Bureau of Statistics of the Department of Commerce and Labor, on transportation throughout the world. Mr. Austin has lately made a tour of the world, and gave particular attention to canals and other waterways, and to the means of transportation in China and other countries not well supplied with railways.

#### Traffic Club of Chicago.

At the annual election on March 30, three tickets, the following officers were elected: President, Oscar F. Bell, Crane Co., Chicago; First Vice-President, Fred Zimmerman, Michigan Central; Second Vice-President, J. C. Madison, Montgomery Ward & Co., Chicago; Third Vice-President, W. H. Johnson, Pennsylvania Railroad; Treasurer, John H. Grace, Great Northern; Secretary, John T. Stockton, Joseph Stockton Transfer Co., Chicago; Directors for two years: F. T. Bentley, Illinois Steel Co., Chicago; D. W. Cooke, Erie; G. H. Ingalls, New York Central; F. B. Montgomery, International Harvester Co., Chicago.

It was announced that 5,000 sq. ft. on the 18th floor of the New LaSalle hotel has been rented for club rooms, to be ready September 1. The present membership is 545.

#### Western Canada Railway Club.

The Western Canada Railway Club was organized in February. Meetings are to be held in Winnipeg, Man., on the second Monday of each month except June, July and August. The officers are as follows: Honorary President—Wm. Whyte, Second Vice-President, C. P. Honorary Vice-Presidents—M. H. McLeod, General Manager, C. N.; G. J. Bury, General Manager, C. P.; G. W. Caye, Asst. to Vice-Pres. & Genl. Manager, G. T. P.; W. Phillips, General Manager, Winnipeg Elect. Ry. President—Grant Hall, Supt. Motive Power, C. P. Vice-President—A. E. Cox, General Storekeeper, C. N. Second Vice-President—L. B. Mirriam, Div. Chief Engr., G. T. P. Secretary—W. H. Rosevear, 199 Shestnut street, Winnipeg. Treasurer—E. Humphrys, Chief Clerk to S. M. P., C. P. Executive Committee—E. W. DuVal, Secretary to Genl. Mgr., C. P.; S. J. Hungerford, Supt. of Shops, C. P.; W. R. Smith, Supt. of Shops, C. N.; R. R. Neild, Genl. Foreman of Shops, C. P.; C. W. Cooper, Asst. Genl. Passr. Agent, C. N.; J. McKenzie, Purch. Agent, Winnipeg Elect. Ry.; L. O. Moody, Mgr. Northwestern Brass Co.

Audit Committee—L. O. Genest, Genl. Storekeeper, C. P.; A. H. Mulcahey, Purch. Dept., G. T. P.; A. Shields, Master Mechanic, C. N.

#### Chicago Railway Club.

The following officers and directors of the new Chicago Railway Club have been elected: President, W. B. Barr; Vice-President, W. J. Leahy; Secretary, C. Nyquist; Treasurer, H. E. R. Wood; Board of Directors, W. B. Barr, E. J. Engle, Charles G. Hall, Herbert Hasse, H. E. Pierpont, W. J. Leahy, F. H. Tristram, E. P. Skene and E. L. Bevington. The first meeting will be held at the Auditorium Hotel on Friday evening, April 2.

The object of the club is stated in the constitution and by-laws to be to secure for the members and for the transportation companies they represent the benefits that flow from personal acquaintance among the members and the constant interchange of ideas and experiences. Those eligible to membership are executive and other officers, chief clerks and men holding co-ordinate or superior positions with railway and steamship companies and traffic associations. The admission fee will be \$5 and the annual dues \$20. It is expected to get club rooms soon.

#### MEETINGS AND CONVENTIONS.

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

AIR BRAKE ASSOCIATION.—F. M. Nellis, 53 State St., Boston, Mass.; May 11-14, 1909; Richmond, Va.  
AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—A. G. Thomason, Scranton, Pa.; May 11; St. Louis, Mo.  
AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS.—R. W. Pope, 33 West 39th street, New York; second Friday in month; New York.  
AMERICAN RAILWAY ASSOCIATION.—W. F. Allen, 24 Park Place, New York; May 19, 1909; New York.  
AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—S. F. Patterson, B. & M., Concord, N. H.; Oct. 19, 1909; Jacksonville, Fla.  
AMERICAN RAILWAY ENGINEERING AND MAINT. OF WAY ASSOC.—E. H. Fritch, Monadnock Bldg., Chicago.  
AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, Old Colony Bldg., Chicago; June 16-18, 1909; Atlantic City.  
AMERICAN SOCIETY OF CIVIL ENGINEERS.—C. W. Hunt, 220 W. 57th St.; N. Y.; 1st and 3d Wed., except July and August; New York.  
AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., N. Y.; 2d Tues. in month; annual, Dec. 7-10; New York.  
AMERICAN STREET AND INTERURBAN RAILWAY ASSOCIATION.—B. V. Swenson, 29 W. 39th St., New York.  
ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—C. G. Phillips, 143 Dearborn St., Chicago; April 28, 1909; Cincinnati.  
ASSOCIATION OF RAILWAY CLAIM AGENTS.—E. H. Hemus, A. T. & S. F., Topeka, Kan.; last week in May, 1909; Detroit, Mich.  
ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—P. W. Drew, Wisconsin Central Ry., Chicago; June 23-25, 1909; Detroit.  
ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 24 Park Pl., New York; June 22-23; Montreal.  
CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk Ry., Montreal, Que.; 1st Tues. in month, except June, July and Aug.; Montreal.  
CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, Montreal, Que.; irregular, usually weekly; Montreal.  
CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York; 2d Friday in January, March, May, Sept. and Nov.; Buffalo.  
FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Rich. & Pot. R.R., Richmond, Va.; June 16, 1909; Old Point Comfort, Va.  
INTERNATIONAL MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., N. Y.; April 27-30, 1909; Louisville, Ky.  
INTERNATIONAL RAILWAY FUEL ASSOCIATION.—D. B. Sebastian, La Salle St. Station, Chicago; June 21-23, 1909; Chicago.  
INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—E. C. Cook, Royal Insurance Bldg., Chicago; June 1-5; Chicago.  
IOWA RAILWAY CLUB.—W. B. Harrison, Union Station, Des Moines, Ia.; 2d Friday in month, except July and August; Des Moines.  
MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, Old Colony Bldg., Chicago; June 21-23, 1909; Atlantic City.  
NEW ENGLAND RAILROAD CLUB.—G. H. Frazier, 10 Oliver St., Boston, Mass.; 2d Tues. in month, ex. June, July, Aug. and Sept.; Boston.  
NEW YORK RAILROAD CLUB.—H. D. Vought, 95 Liberty St., New York; 3d Friday, in month, except June, July and August; New York.  
NORTH-WEST RAILWAY CLUB.—T. W. Flannagan, Soo Line, Minn.; 1st Tues. after 2d Mon., ex. June, July, Aug.; St. Paul and Minn.  
RAILWAY CLUB OF PITTSBURGH.—J. D. Conway, Pittsburgh, Pa.; 4th Friday in month, except June, July and August; Pittsburgh.  
RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, 12 North Linden St., Bethlehem, Pa.  
RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, Box C, Collinwood, Ohio; May 17-19; Chicago.  
ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—Walter E. Emery, P. & P. U. Ry., Peoria, Ill.; Nov., 1909; Washington.  
ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug.; St. Louis.  
SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—J. H. O'Donnell, Bogalusa, La.; April 15; Atlanta, Ga.  
SOUTHERN AND SOUTHWESTERN RY. CLUB.—A. J. Merrill, Prudential Bldg., Atlanta; 3d Thurs., Jan., April, Aug. and Nov.; Atlanta.  
TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. & H. R. R.R., East Buffalo, N. Y.; September, 1909; Denver.  
WESTERN RAILWAY CLUB.—J. W. Taylor, Old Colony Bldg., Chicago; 3d Tuesday each month except June, July and August; Chicago.  
WESTERN SOCIETY OF ENGINEERS.—J. H. Warder, Monadnock Bldg., Chicago; 1st Wednesday, except July and August; Chicago.

## Traffic News.

The Chicago, Milwaukee & St. Paul on March 28 began running its Pioneer Limited, its "crack" train between Chicago and St. Paul, in two sections. The first section will reach St. Paul at 7:15 a.m.

The Burlington has announced that on May 23 it will put on a new passenger train between Chicago and Denver. It will leave Chicago daily at noon.

The Pacific Northwest Demurrage Bureau had 71,687 cars reported in February, 1909, with 3,553 cars held overtime and 0.95 per cent. of cars released in free time.

The Buffalo, Rochester & Pittsburgh announces that the free time allowed for unloading coal and coke after April 15 will be 48 hours. At present the allowance is 72 hours.

An officer of the National Railways of Mexico denies the report that the government is to make a general revision of rates. An extensive revision, resulting mostly in increases, was made about two years ago.

The Wisconsin Demurrage Bureau reported 86,308 cars in February, 1909, as compared with 83,539 in the same month for 1908. The average day's detention by the railway was 0.17 this year and 0.16 in 1908. The average day's detention by consignee was 1.35 this year and 1.56 last year, making the total day's detention 1.52 days in February, 1909, and 1.72 days in February, 1908.

The National Railways of Mexico, now controlled by the government and operated as a single system, have given notice that ticket agents will sell tickets over practically any route between two points which a passenger may desire to take. For example, a passenger from the city of Mexico to Porfirio Diaz may go by way of Torreon or by Monterey, or over parts of both lines.

Frank Barry has been appointed Manager of the Syracuse (N. Y.) Traffic Bureau. Mr. Barry was formerly connected with the traffic departments of the Missouri Pacific, the Wabash and the Chicago, Milwaukee & St. Paul, later a traffic man for commercial interests, and for the last year or two chief of the traffic division of the New York State Public Service Commission, Second district.

The committee on Common Carriers of the Texas House has reported against the passage of a 2-cent fare law. It opposes the bill on four grounds: First, that such legislation would tend to reduce the wages of railway employees; second, if it did not have this tendency it would tend to increase freight rates; third, it would hinder the development of railways in Texas; fourth, the Railroad Commission has investigated the subject and decided that at present the roads could not stand a 2-cent fare.

The notice recently given by the trunk lines that they would reduce rates on grain from Buffalo to New York on the opening of navigation, was followed the next day by announcements from Montreal that the Canadian Transportation Co. would make a rate of 5½ cents a bushel from Fort William to Montreal. The Grand Trunk Railway will, no doubt, make a rate from Georgian Bay to meet that of the water lines. All of these reductions apply to export shipments only. As there will be no terminal charges at Montreal, shippers there calculate that their rate will be nine mills a bushel better than the rates through New York.

Business men representing more than 20 towns in Oklahoma met in Oklahoma City on March 23 and discussed the boycott declared by the merchants of Kansas City against the Missouri, Kansas & Texas because that road granted Oklahoma City a reduced rate on freight from New York via Galveston. Resolutions were adopted endorsing the action of the Katy and warning the merchants of Kansas City that unless they within five days withdraw their boycott against that road the business men of Oklahoma would declare a boycott against Kansas City. An executive committee was appointed to act in case the Kansas City boycott was not withdrawn within five days. Attorney-General West, of Oklahoma, has addressed a letter to Governor Haskell, suggesting that a communication

be sent to Oklahoma bankers carrying deposits in Kansas City banks, asking that they protest against Kansas City's boycott of the Katy and indicate that unless the boycott is withdrawn the reserves of Oklahoma banks in Kansas City banks will be withdrawn.

Since the first of the year the Atlanta, Birmingham & Atlantic has established a through package car service from Atlanta, Ga., to points in Alabama, Middle and Southern Georgia and Florida. Fifteen cars are run from Atlanta daily, regardless of tonnage, to an equal number of points, in addition to through car service in connection with other roads, which enables the Atlanta, Birmingham & Atlantic to make fourth day delivery, to points on its line, of merchandise from Chicago and other central western points. Its service from Chicago is operated in connection with the Chicago & Eastern Illinois, the Louisville & Nashville and the Nashville, Chattanooga & St. Louis.

It is announced that the special Trunk Lines committee appointed to consider the subject has decided to take no action in connection with the rates on import freight from Boston to the West. The recent reduction of 1 cent per 100 lbs., by the Boston & Maine, was objected to by the differential lines from New York, Baltimore, etc.; but the conclusion is that rates had better be maintained from the other ports and allow Boston to have its way; for the amount of import traffic moving by way of Boston is not large. The Boston & Albany made a reduction from Boston to meet that of the Boston & Maine, and the present conclusion is that the Boston & Albany and the Boston & Maine may adjust the matter as they please.

The Hudson & Manhattan, operating the tunnel railway between New York and Hoboken, announces that in the morning rush hours to New York and the evening rush hours to Hoboken—two hours in the morning and 2½ hours in the evening—one car of each train will be reserved for ladies; and if the experiment proves satisfactory the practice will be made permanent. This announcement follows considerable discussion in the newspapers concerning the practicability of trying an experiment of this kind on the subway express trains of the Interborough Rapid Transit Co. This question (as to the Interborough lines) is now under discussion, and the Public Service Commission, having received complaints on the subject, will hold a hearing.

The railway committees of the two houses of the Iowa legislature and G. S. Fernald, General Counsel of the Pullman Company, have entered into an agreement under which the Iowa legislature will not pass any law reducing the Pullman Company's rates in that state and the Pullman Company will make in return some substantial reductions. A bill has been pending in the legislature fixing a maximum berth rate in Iowa of \$1.50 for a 10-hour trip; the present maximum rate is \$2. Mr. Fernald has promised that his company within seven days will file with the Railroad Commission a schedule under which there will be reductions from \$2 to \$1.50 in all rates from the west bank of the Mississippi river to and including the following towns: Sanborn on the northern Iowa line of the St. Paul; Cherokee on the Illinois Central; Wall Lake on the North Western; Carroll on the North Western and the Great Western; Atlantic on the Rock Island, and Red Oak on the Burlington. The rate will be reduced from \$2 to \$1.50 from the east bank of the Missouri river up to and including the following towns: New Hampton on the North Iowa line of the St. Paul; Oelwein on the Great Western; Marion on the St. Paul; Cedar Rapids on the North Western; Iowa City on the Rock Island, and Ottumwa on the Burlington.

The newspapers of Illinois on March 28 printed statements to the effect that there had been an enormous increase in the earnings of Illinois railways under the 2-cent fare law. These statements purported to be based on the annual report of the Illinois Railroad Commission for the year ended June 30, 1908. The 2-cent fare law went into effect in Illinois in July, 1907. A careful inspection of the report shows that the supposed large increases were mainly mere paper increases, due to changes in methods of accounting. According to the newspaper reports the total number of passengers carried increased from 57,218,825 in 1907 to 76,842,521 in 1908. On this basis the increase in earnings from passenger traffic

was \$1,906,000. It was reported also that there was an increase in mail, express and miscellaneous earnings from passenger service that increased the total earnings from passenger service by \$3,079,232. But among the increases in passengers carried in Illinois shown are that of the Chicago & North Western from 2,420,207 in 1907 to 15,326,673 in 1908; that of the Chicago, Burlington & Quincy from 4,147,753 in 1907 to 8,005,341 in 1908, and that of the Chicago, Milwaukee & St. Paul, which did not report in 1907 that it carried any passengers at all in Illinois, but for 1908 reported 2,017,161. It will be noted that these increases alone aggregate almost 19,000,000 passengers. The reason for these abnormal increases is that in previous years the railways reported their passenger traffic on a mileage basis, the average in Illinois being, of course, pulled down by being mixed up with the traffic in such states as South Dakota and North Dakota, while this year the roads reported the actual traffic and earnings in Illinois. Eliminating the railways that have shown such abnormal increases due to changes in accounting the report shows that the other roads of the state in 1908 carried 51,200,000 passengers as compared with 50,335,000 in 1907, an increase of about 865,000. The total revenue from freight service in 1907 was \$120,621,000 as compared with \$112,782,000 in 1908, a decrease of \$7,139,000.

#### INTERSTATE COMMERCE COMMISSION.

##### Yarding-in-Transit.

*National Lumber Co. v. San Pedro, Los Angeles & Salt Lake. Opinion (825) by Commissioner Lane. Case No. 1897.*

Prior to August 28, 1906, defendant allowed shippers a yarding-in-transit privilege on lumber shipped from San Pedro to Los Angeles and subsequently reshipped to other destinations. This privilege was not covered by published tariff. Shippers were denied the benefit of this privilege between August 28, 1906, and June 1, 1907, when it was made effective in defendant's regularly established tariff. Reparation cannot be awarded because a carrier has ceased to grant an unpublished privilege, which amounted to nothing less than a departure from the legal tariff, and that transit privileges cannot be given a retroactive effect.

##### Discrimination Against Denver.

*George J. Kindel v. New York, New Haven & Hartford et al. Opinion by Commissioner Clark.*

Complaint alleges that, generally, rates from the Missouri river and east thereof to Denver, Colo., and from Denver to Utah common points are discriminatory, unreasonable and excessive. The present adjustment of rates is discriminatory against Denver, in favor of Kansas City and other Missouri river crossings, and the class rates from Chicago and from St. Louis to Denver are excessive and unreasonable, and they should be reduced. Further, the class rates from the Missouri river to Denver and from Denver to Utah common points are unreasonable and excessive, but no order will be entered herein reducing those rates, as it seems obvious that they must be readjusted in harmony with the principles announced in the *Spokane case*, either through voluntary action of the carriers or in some other proceeding before this commission.

##### Discrimination Against Indianapolis.

*Indianapolis Freight Bureau v. Pennsylvania et al. Indianapolis Freight Bureau v. Illinois Central et al. Opinion by Commissioner Clark.*

Complaint alleges unjust discrimination against Indianapolis, Ind., in that the long-established relationship of rates between Indianapolis on the one hand and St. Louis and the Ohio river crossings on the other hand has been departed from in adjusting rates on sugar and on coffee from New Orleans, La., and from Atlantic seaboard points to Indianapolis and to St. Louis and the Ohio river crossings.

Departure from the former relationship of rates on sugar from New Orleans to Indianapolis and to St. Louis and the Ohio river crossings is not unjustly discriminatory against Indianapolis, because the rates on sugar from New Orleans

to St. Louis and to the Ohio river crossings are controlled by potential water competition; but it is unjustly discriminatory against Indianapolis to depart from the former relationship of rates on coffee as between Indianapolis and St. Louis and the Ohio river crossings, because such rates on coffee are not controlled by the water competition.

Rates on sugar from Atlantic seaboard points to St. Louis and the Ohio river crossings are controlled by the water-controlled rates from New Orleans and therefore it is not unjustly discriminatory against Indianapolis to depart from the former relationship of rates on sugar from Atlantic seaboard points to Indianapolis and to St. Louis and the Ohio river crossings; but it is unjustly discriminatory against Indianapolis to depart from the former relationship of rates on coffee as between Indianapolis and St. Louis and Ohio river crossings, which are not so controlled by water competition.

#### STATE COMMISSIONS.

The Railroad Commission of Louisiana has issued an order that whenever a carload shipment of lumber moves over two or more track scales, whether the shipment be over one road or more, the car shall be weighed by the carrier on the first scales over which it passes, and upon the weight then found the freight charges shall be assessed, provided that in case of dispute by the consignee as to the correctness of the weight, the carrier shall, when there are track scales at the point of destination, re-weigh the car on them, and if there is a difference in the two weights the freight bill shall be corrected to conform with the last weighing. For the re-weighing of the car the consignee shall pay the carrier performing the service \$1.50 when his contention is not substantiated to the extent of 1 per cent., and the only additional free time allowed on such a shipment shall be from the time the consignee orders the car re-weighed until he shall receive written notice of the re-weigh. Re-weighing must be done in the presence of the consignee if he so requests.

##### Pennsylvania: Affording Terminal Facilities to a Competitor.

*Manufacturers' Association of York v. Northern Central and the Western Maryland. Opinion by Chairman Ewing.*

The Northern Central, one of the Pennsylvania lines, built its line into the city of York, Pa., in 1876. In 1893, two roads, one of which has since been taken over by the Northern Central and the other by the Western Maryland, made an agreement by which they bound themselves to exchange cars at the nearest convenient point for delivery to consignees on lines of their respective roads, the agreement to apply only to certain territory in the city of York and not to any other territory. The company receiving the cars was to deliver them at cost, but since this service was to be performed at cost, in practice the delivering company uses its own locomotives to haul cars over the tracks of its competitor to delivering points within the specified limits of the city.

Shippers situated in York but not within these specified limits complain that the refusal of the companies to allow the free interchange of cars at York is an unjust discrimination. While the Interstate Commerce Commission law recognizes the common law principle that competing roads do not necessarily have to afford terminal facilities to each other, yet it is the opinion of the commission [of Pennsylvania] that if these facilities are afforded to certain shippers located at York, they should be afforded to all shippers at York. The commission while not deciding conclusively that the granting of trackage rights for delivery and receipt of freight at York is affording terminal facilities as between competitors, nevertheless says that these privileges must be afforded to all shippers at York, and finds that the present agreement, which may have been logically enough the outcome of a compromise, is, as a matter of fact, a discrimination against certain shippers, that is, those who are not located within the limits specified by the original agreement of 1893. They therefore recommend that some arrangement be made so that all shippers at York are put on an equality as to the receipt and delivery of cars of the Western Maryland and of the Northern Central.

## REVENUES AND EXPENSES OF RAILWAYS.

MONTH OF JANUARY, 1909.

(See also issues of March 5, 12, and 26.)

Name of road.	Mileage operated at end of period.	Operating revenues.			Operating expenses.			Net operating revenues (or deficit).	Outside operations, net.	Taxes.	Operating (or loss).	Increase (or dec.) comp. with last year.
		Freight.	Passenger.	Total.	Way and structures.	Maintenance of equipment.	Traffic.	Trans- portation.				
Atlanta & West Point	93	\$46,927	\$32,527	\$79,454	\$12,140	\$14,821	\$4,479	\$28,142	\$64,023	\$2,461	\$10,345	\$8,159
Atlantic & St. Lawrence	167	86,752	14,080	100,832	16,360	18,568	3,819	36,738	67,780	6,846	41,038	35,078
Atlantic City	167	43,575	29,071	72,646	11,356	11,356	2,889	55,148	89,785	7,000	28,195	23,120
Bessemer & Lake Erie	201	219,468	17,608	237,076	35,715	93,703	6,881	94,478	239,078	6,000	2,276	19,329
Cincinnati & Muskingum Valley	148	38,215	14,182	52,397	10,375	8,456	1,925	25,424	83,884	3,360	261	16,705
Cleveland, Lorain & Wheeling	194	141,713	15,482	157,195	24,401	46,098	5,854	82,148	165,920	9,406	12,837	54,471
Cleveland Terminal & Valley	93	58,335	11,176	69,511	11,982	7,443	1,358	36,267	158,762	3,359	13,537	2,236
Coal & Coke	191	35,990	8,517	44,507	13,027	13,027	650	13,887	32,041	3,500	12,600	7,775
Cincinnati Northern	248	61,131	12,438	73,569	10,476	17,877	2,596	32,309	66,073	4,100	6,966	12,145
Duluth & Iron Range	168	54,406	16,611	71,017	32,230	34,685	2,607	51,801	128,502	3,391	55,443	17,329
Eastern Ry. of New Mexico	227	36,093	32,952	69,045	11,377	4,644	1,106	20,940	40,274	3,481	29,421	15,367
Fort Smith & Western	221	36,093	32,952	69,045	11,377	4,644	1,106	20,940	40,274	3,481	29,421	15,367
Chicago Terminal Transfer	221	6,827	1,324	8,151	18,822	13,888	2,657	17,994	54,338	7,000	5,202	19,307
Gila Valley, Globe & Northern	90	64,808	10,651	75,459	9,447	23,783	5,62	40,677	79,804	14,482	15,824	3,620
Green Bay & Western	125	32,121	21,824	53,945	34,876	10,297	534	14,987	65,384	1,900	0,765	14,825
Houston, East & West Texas	191	69,312	21,824	91,136	22,627	9,542	1,015	33,788	112,876	5,000	4,760	7,506
Indianapolis Southern	233	88,288	15,515	103,803	12,738	27,071	4,003	65,858	112,876	5,000	4,760	7,506
International Ry. of Maine	170	37,124	1,014	38,138	12,331	7,153	3,617	14,928	70,447	850	5,561	2,242
Lehigh & New England	226	99,025	12,073	111,098	14,850	22,160	1,618	27,530	44,072	1,760	42,312	21,736
Louisiana & Arkansas	200	53,871	28,021	81,892	15,728	7,881	3,226	29,385	59,312	2,500	25,446	20,116
Mineral Range	130	57,839	3,299	61,138	11,513	10,531	1,134	35,253	59,312	3,200	25,446	20,116
Missouri & International	177	36,301	10,909	47,210	4,235	5,145	1,802	16,136	27,440	1,894	19,227	10,330
Pecos & Northern Texas	152	54,483	25,511	80,000	14,870	6,214	1,228	28,171	53,415	876	29,799	40,933
Pittsburg, Shawmut & Northern	238	48,570	6,802	55,372	24,787	12,069	1,938	25,508	31,821	1,525	6,981	27,086
Rio Grande Southern	180	30,861	6,119	36,980	9,435	3,725	30	17,208	56,341	2,200	56,931	35,695
Southern Indiana	237	69,467	10,958	80,425	14,850	22,160	1,618	27,530	44,072	1,760	42,312	21,736
Southern Kansas Ry. of Texas	237	30,861	6,119	36,980	9,435	3,725	30	17,208	56,341	2,200	56,931	35,695
Spokane & Inland Empire	125	44,736	23,994	68,730	16,396	7,435	1,011	27,102	54,565	1,083	16,950	16,338
Terminal R. R. Ass'n of St. Louis	168	16,370	23,994	40,364	10,833	6,101	2,477	66,048	49,228	2,550	76,226	11,512
Union R.R. (Baltimore)	31	31,499	11,113	42,612	22,159	10,091	707	25,517	103,465	2,390	41,080	34,861
Union R.R. (Pittsburgh)	31	64,227	16,355	80,582	28,149	42,766	100	89,331	163,445	2,881	19,256	8,826
Washington Southern	34	25,626	33,871	59,497	7,697	16,306	839	5,054	48,610	2,345	28,166	42,748
Western Ry. of Alabama	133	50,092	32,971	83,063	16,505	16,636	4,354	26,572	68,047	4,835	16,827	1,166
Atlanta & West Point	93	\$201,188	\$242,203	\$443,391	\$584,414	\$77,219	\$124,889	\$28,918	\$1,928,849	\$1,482	\$105,225	\$24,156
Atlantic & St. Lawrence	167	499,164	180,743	679,907	131,465	189,564	21,891	307,982	1,698,895	47,919	121,076	146,300
Atlantic City	167	369,164	599,977	969,141	166,782	79,476	11,231	488,845	2,044,063	49,000	182,834	56,076
Bessemer & Lake Erie	201	3,639,289	193,458	3,832,747	3,870,326	686,068	41,273	1,012,640	5,887,24	61,000	1,646,881	1,587,24
Cincinnati & Muskingum Valley	148	352,199	117,753	470,952	90,592	64,334	11,921	178,548	1,141,295	28,996	112,299	29,932
Cleveland, Lorain & Wheeling	194	2,061,611	137,817	2,199,428	2,244,615	424,002	42,061	781,191	832,346	65,845	766,501	1,115,038
Cleveland Terminal & Valley	93	480,138	101,869	582,007	79,062	60,538	9,838	259,820	208,024	23,511	108,245	6,054
Coal & Coke	191	286,285	76,018	362,303	64,974	52,84	5,284	102,623	420,271	24,500	108,245	61,992
Cincinnati Northern	248	456,482	139,810	596,292	131,064	176,190	18,433	232,218	1,030,004	26,917	58,594	17,106
Duluth & Iron Range	168	297,124	231,215	528,339	524,685	337,479	2,870	766,024	1,703,004	191,419	2,865,425	251,703
Eastern Ry. of New Mexico	227	274,518	231,215	505,733	114,832	97,538	7,636	129,231	311,587	21,155	226,589	55,617
Fort Smith & Western	221	274,518	231,215	505,733	114,832	97,538	7,636	129,231	311,587	21,155	226,589	55,617
Chicago Terminal Transfer	221	54,127	14,383	68,510	97,538	64,267	5,412	300,764	601,100	45,500	46,776	108,855
Gila Valley, Globe & Northern	90	451,497	72,873	524,370	119,678	47,509	2,485	123,009	302,965	101,376	234,399	24,233
Green Bay & Western	125	229,408	100,451	329,859	73,524	56,747	2,713	99,207	247,192	12,793	98,994	9,286
Houston, East & West Texas	191	509,590	187,183	696,773	124,875	17,773	8,745	227,037	1,118,298	20,835	255,051	68,887
Indianapolis Southern	233	345,770	144,821	490,591	68,469	68,469	7,820	230,321	1,263,94	16,742	109,652	98,258
International Ry. of Maine	170	345,770	144,821	490,591	112,080	101,174	27,046	232,888	230,031	35,000	11,969	13,634
Lehigh & New England	226	420,080	11,583	431,663	90,925	55,569	11,127	123,746	497,676	5,950	140,333	24,370
Louisiana & Arkansas	200	558,381	94,266	652,647	132,153	133,043	11,127	190,778	1,863,066	10,060	176,846	143,239
Louisville, Henderson & St. Louis	130	339,387	235,614	575,001	81,727	53,026	2,480	192,383	398,692	17,500	185,649	49,474
Minnesota & International	152	446,724	94,961	541,685	66,712	36,712	1,698	103,641	230,377	24,214	67,606	13,455
Pecos & Northern Texas	177	220,821	181,084	401,905	98,351	66,404	5,982	193,487	91,820	13,407	204,496	234,145
Pittsburg, Shawmut & Northern	238	553,429	375,129	928,558	194,975	159,743	7,414	383,024	250,060	3,879	10,863	52,376
Rio Grande Southern	180	360,659	69,173	429,832	137,233	159,743	14,324	383,024	326,647	1,400	325,247	131,817
Southern Indiana	237	585,045	98,262	683,307	171,536	20,996	8,223	211,864	1,138,550	17,200	126,650	3,248
Spokane & Inland Empire	125	176,408	151,732	328,140	97,831	127,529	11,577	201,866	215,583	48,499	167,084	198,394
Spokane & Inland Empire	125	176,408	151,732	328,140	97,831	127,529	11,577	201,866	215,583	48,499	167,084	198,394
Terminal R. R. Ass'n of St. Louis	26	340,659	239,047	579,706	1,725	1,725	7,000	610,185	1,116,059	10,863	10,555	131,817
Union R.R. (Baltimore)	31	510,558	122,256	632,814	1,725	1,725	7,000	610,185	1,116,059	10,863	10,555	131,817
Union R.R. (Pittsburgh)	31	205,243	190,804	396,047	645,178	39,569	1,765	33,356	85,754	2,130	67,935	65,759
Washington Southern	34	327,860	268,556	596,416	116,161	104,736	28,305	184,350	262,029	16,414	170,453	109,746
Western Ry. of Alabama	133											

\*Deficit. †Loss. ‡Decrease.

## SUMMARY OF MONTHLY REPORTS OF REVENUES AND EXPENSES OF RAILWAYS. FOR SEVEN MONTHS ENDED JANUARY 31, 1909.

JULY.	Companies reporting— No. Mileage.	Revenues.			Maintenance— Of way & structures. equipment.			Expenses— Traffic. portation.		Total operating revenue.		Outside operations net.		Total net revenue.		One-twelfth annual taxes.		Operating income.	
		Freight.	Passenger.	Total operating.	Freight.	Passenger.	Total operating.	Freight.	Passenger.	Freight.	Passenger.	Freight.	Passenger.	Freight.	Passenger.	Freight.	Passenger.	Freight.	Passenger.
1907. Amount .....	770	\$23,877	\$154,335,610	\$56,465,908	\$227,966,607	\$32,532,992	\$55,750,400	\$4,304,186	\$75,292,508	\$152,783,745	\$75,182,962	\$716,921	\$75,899,883	\$6,781,495	\$69,118,389	\$6,781,495	\$69,118,389	\$6,781,495	\$69,118,389
1908. Amount .....	792	229,220	127,221,139	52,148,138	194,634,612	26,893,423	27,447,708	3,993,854	64,351,868	127,777,867	66,856,745	834,215	67,710,960	7,140,687	60,570,273	7,140,687	60,570,273	7,140,687	60,570,273
1907. Per mile of line .....	.....	689	555	227	1,018	145	117	17	281	682	336	3	339	30	309	339	30	309	309
1908. Per mile of line .....	.....	555	227	849	1,018	145	117	17	281	682	336	3	339	30	309	339	30	309	309
1907. Ratio per cent. ....	.....	67.70	24.77	100.00	14.27	15.68	13.82	1.89	33.03	67.02	32.98	.....	.....	.....	.....	.....	.....	.....	.....
1908. Ratio per cent. ....	.....	65.36	26.79	100.00	13.82	14.10	13.82	2.05	33.06	65.65	34.35	.....	.....	.....	.....	.....	.....	.....	.....
AUG.																			
1907. Amount .....	776	\$224,416	\$101,759,324	\$61,691,128	\$240,601,077	\$34,029,133	\$36,489,054	\$4,167,425	\$76,847,314	\$156,543,908	\$84,037,169	\$977,217	\$85,034,387	\$6,883,371	\$78,151,015	\$6,883,371	\$78,151,015	\$6,883,371	\$78,151,015
1908. Amount .....	794	229,309	134,210,198	56,755,743	206,254,003	27,732,968	29,203,417	3,887,822	65,704,012	131,386,157	74,867,846	898,077	75,765,923	7,260,511	68,505,412	7,260,511	68,505,412	7,260,511	68,505,412
1907. Per mile of line .....	.....	720	585	247	1,072	151	127	18	342	697	374	4	378	30	348	378	30	348	348
1908. Per mile of line .....	.....	585	247	899	1,072	151	127	18	342	697	374	4	378	30	348	378	30	348	348
1907. Ratio per cent. ....	.....	67.23	25.64	100.00	14.14	15.17	13.94	1.73	31.85	65.06	34.94	.....	.....	.....	.....	.....	.....	.....	.....
1908. Ratio per cent. ....	.....	65.07	27.52	100.00	13.45	14.16	13.85	1.88	31.85	63.70	36.30	.....	.....	.....	.....	.....	.....	.....	.....
SEPT.																			
1907. Amount .....	775	\$224,654	\$159,664,897	\$57,368,722	\$233,735,975	\$33,333,986	\$36,176,765	\$4,231,697	\$77,475,285	\$156,379,839	\$87,356,135	\$711,150	\$78,067,286	\$6,835,131	\$71,232,154	\$6,835,131	\$71,232,154	\$6,835,131	\$71,232,154
1908. Amount .....	792	229,406	149,099,645	53,569,234	218,399,159	28,630,240	31,640,001	3,951,368	67,687,711	136,942,269	81,456,890	635,792	82,092,683	7,376,808	74,715,874	7,376,808	74,715,874	7,376,808	74,715,874
1907. Per mile of line .....	.....	710	585	255	1,040	148	127	18	344	696	344	3	347	30	317	347	30	317	317
1908. Per mile of line .....	.....	585	255	952	1,040	148	127	18	344	696	344	3	347	30	317	347	30	317	317
1907. Ratio per cent. ....	.....	68.31	24.54	100.00	14.26	15.48	13.14	1.81	33.14	66.90	33.10	.....	.....	.....	.....	.....	.....	.....	.....
1908. Ratio per cent. ....	.....	68.27	24.53	100.00	13.11	14.49	13.09	1.81	30.99	62.70	37.30	.....	.....	.....	.....	.....	.....	.....	.....
OCT.																			
1907. Amount .....	776	\$225,217	\$180,467,548	\$52,957,046	\$250,976,436	\$35,488,005	\$38,958,319	\$4,408,922	\$83,708,710	\$167,945,936	\$83,030,499	.....	.....	.....	.....	.....	.....	.....	.....
1908. Amount .....	740	227,680	165,555,298	49,008,919	231,184,082	28,045,186	33,458,045	4,065,535	72,226,189	142,952,898	88,231,184	\$574,360	88,805,544	7,633,944	81,171,599	7,633,944	81,171,599	7,633,944	81,171,599
1907. Per mile of line .....	.....	801	663	235	1,114	157	127	19	371	745	368	.....	.....	.....	.....	.....	.....	.....	.....
1908. Per mile of line .....	.....	663	235	926	1,114	157	127	19	371	745	368	.....	.....	.....	.....	.....	.....	.....	.....
1907. Ratio per cent. ....	.....	71.91	21.10	100.00	14.14	15.52	13.35	1.76	33.35	66.92	33.08	.....	.....	.....	.....	.....	.....	.....	.....
1908. Ratio per cent. ....	.....	71.61	21.20	100.00	12.13	14.47	13.24	1.76	31.24	61.83	38.17	.....	.....	.....	.....	.....	.....	.....	.....
NOV.																			
1907. Amount .....	673	\$222,100	\$155,439,291	\$45,001,783	\$217,465,144	\$28,184,975	\$34,959,696	\$3,964,948	\$79,379,711	\$151,607,818	\$65,857,325	\$368,465	\$66,225,791	\$6,833,504	\$59,392,287	\$6,833,504	\$59,392,287	\$6,833,504	\$59,392,287
1908. Amount .....	659	226,551	150,256,617	43,372,432	209,852,055	24,869,115	31,698,840	3,895,989	70,585,109	136,012,760	73,839,295	193,423	74,032,719	7,467,864	66,564,854	7,467,864	66,564,854	7,467,864	66,564,854
1907. Per mile of line .....	.....	699	555	202	979	126	157	17	357	682	296	1	293	30	267	293	30	267	267
1908. Per mile of line .....	.....	555	202	926	979	126	157	17	357	682	296	1	293	30	267	293	30	267	267
1907. Ratio per cent. ....	.....	71.48	20.69	100.00	12.96	16.08	13.82	1.82	36.50	69.72	30.28	.....	.....	.....	.....	.....	.....	.....	.....
1908. Ratio per cent. ....	.....	71.60	20.67	100.00	11.85	15.05	13.64	1.86	33.64	64.81	35.19	.....	.....	.....	.....	.....	.....	.....	.....
DEC.																			
1907. Amount .....	579	\$208,687	\$126,212,593	\$43,866,696	\$185,837,241	\$21,529,207	\$31,651,789	\$3,790,278	\$73,616,491	\$136,018,801	\$49,818,439	\$450,670	\$50,269,110	\$6,540,141	\$43,728,969	\$6,540,141	\$43,728,969	\$6,540,141	\$43,728,969
1908. Amount .....	601	213,700	136,713,517	44,234,311	196,908,534	21,345,453	30,572,787	3,912,740	69,478,231	130,667,891	66,240,643	287,797	66,528,440	7,144,446	59,383,994	7,144,446	59,383,994	7,144,446	59,383,994
1907. Per mile of line .....	.....	604	555	210	890	103	151	18	352	651	238	2	240	31	209	240	31	209	209
1908. Per mile of line .....	.....	555	210	921	890	103	151	18	352	651	238	2	240	31	209	240	31	209	209
1907. Ratio per cent. ....	.....	67.91	23.61	100.00	11.59	17.03	13.19	2.14	39.61	73.19	26.81	.....	.....	.....	.....	.....	.....	.....	.....
1908. Ratio per cent. ....	.....	69.43	22.46	100.00	10.84	15.53	13.64	1.99	35.28	66.36	33.64	.....	.....	.....	.....	.....	.....	.....	.....
JAN.																			
1908. Amount .....	195	\$164,341	\$94,452,128	\$31,945,992	\$138,276,186	\$15,703,781	\$24,151,385	\$3,118,990	\$58,331,185	\$105,288,919	\$32,987,267	\$154,234	\$33,141,501	\$5,440,677	\$27,700,824	\$5,440,677	\$27,700,824	\$5,440,677	\$27,700,824
1909. Amount .....	198	167,493	\$101,430,863	32,717,480	146,197,828	16,372,676	25,178,650	3,189,718	56,851,321	105,705,597	40,492,231	109,999	40,382,231	5,776,224	34,606,006	5,776,224	34,606,006	5,776,224	34,606,006
1908. Per mile of line .....	.....	574	574	194	841	95	146	18	354	640	200	1	201	33	168	201	33	168	168
1909. Per mile of line .....	.....	574	574	194	841	95	146	18	354	640	200	1	201	33	168	201	33	168	168
1908. Ratio per cent. ....	.....	68.31	23.10	100.00	11.36	17.47	13.36	2.25	42.18	76.14	23.86	.....	.....	.....	.....	.....	.....	.....	.....
1909. Ratio per cent. ....	.....	69.38	22.38	100.00	11.20	17.22	13.89	2.18	42.18	72.30	27.70	.....	.....	.....	.....	.....	.....	.....	.....

\* Deficit.

## COURT NEWS.

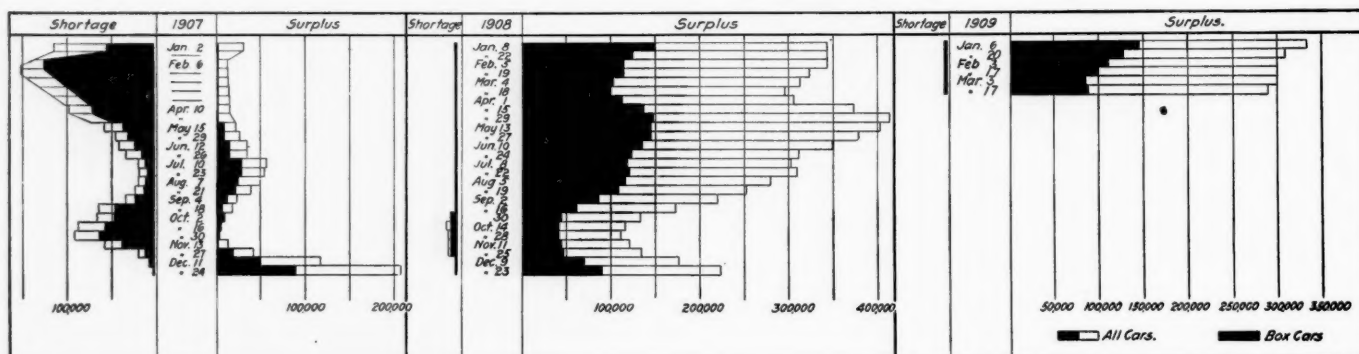
In the United States Circuit Court at New York City, March 29, the New York Central & Hudson River pleaded guilty and paid fines of \$10,000 on 10 counts in an indictment found by the federal grand jury in 1906 for giving rebates on coo- perage material carried from Poplar Bluffs, Mo., to New York, Boston and other places. The road's demurrer had been sus- tained by the lower court, but the United States Supreme Court has now overruled that decision.

The Missouri Pacific has attacked in the Supreme Court of Kansas the constitutionality of the state maximum oil rate law. A shipper in Osborne county got a judgment for \$500 against the road for alleged violation of the act. In his brief, B. P. Waggener, General Attorney of the Missouri Pacific, calls

fining the Wisconsin Central \$17,000, Burton Hanson, former General Freight Agent, \$2,000, and George T. Huey \$1,000 for granting rebates to the Spencer Grain Company, of Min- neapolis. These parties were indicted on 17 counts, it being alleged that the Wisconsin Central charged the Spencer Grain Company 7½ cents per 100 lbs. for transporting barley be- tween Minneapolis and Milwaukee and rebated ½ cent a bushel. The defense of the railway was that the refund was an elevator allowance. The shipment was made July 28, 1905.

## Car Surpluses and Shortages.

Arthur Hale, Chairman of the Committee on Car Efficiency of the American Railway Association, in presenting bulletin No. 43-A, giving a summary of car surpluses and shortages



Car Surpluses and Shortages in 1907, 1908 and 1909.

attention to the fact that provision is made in the law only for single line and double line rates. If oil is shipped over one line 200 miles the maximum rate is 9 cents per 100 lbs.; if the same oil be shipped the same distance over two roads the maximum rate is 10 cents; but if the same oil be shipped the same distance over three roads, then there is no maximum rate to apply, and the three roads may charge any amount

by groups from February 19, 1908, to March 17, 1909, says: "The total surplus for this report is 291,418, a decrease of 8,507 in the two weeks since the date of our last bulletin. Coal cars, which have been on the increase, show a decrease of 9,989, while box cars increased 4,680. Group 2 (Eastern) shows a decrease of 16,360 in coal and gondolas and 954 in box. Group 3 (Middle), while showing a reduction of 2,479

CAR SURPLUSES AND SHORTAGES, FEBRUARY 19, 1908, TO MARCH 17, 1909, INCLUSIVE.

Date.	Number of roads.	Surpluses.				Shortages.			
		Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Total.	Box.	Flat.	Coal, gondola and hopper.
March 17, 1909.....	161	88,459	20,328	139,997	42,634	291,418	310	74	27
March 3, 1909.....	158	83,779	21,438	149,986	44,722	299,925	271	122	11
February 17, 1909.....	159	98,512	23,924	135,208	43,797	301,441	266	97	11
February 3, 1909.....	165	110,632	26,121	122,711	42,107	301,571	97	31	49
January 20, 1909.....	162	127,204	26,723	116,680	41,057	311,664	163	21	139
January 6, 1909.....	156	146,255	25,383	117,686	43,695	333,019	170	202	120
December 23, 1908.....	158	87,350	16,247	79,595	38,885	222,077	471	42	289
December 9, 1908.....	161	67,550	15,336	58,816	33,941	175,643	1,134	73	276
November 25, 1908.....	160	45,194	12,157	43,854	31,624	132,829	7,923	178	900
October 28, 1908.....	158	39,383	10,185	31,541	29,803	110,912	8,175	167	2,261
September 30, 1908.....	160	42,593	10,865	49,795	31,039	133,792	7,313	450	224
August 19, 1908.....	160	106,367	13,494	92,500	40,642	253,003	465	90	105
July 22, 1908.....	166	120,580	14,401	125,739	47,960	308,680	115	37	330
June 24, 1908.....	163	123,112	18,042	130,149	41,995	313,298	268	34	120
May 27, 1908.....	160	144,697	20,075	162,695	54,437	381,904	82	13	12
April 29, 1908.....	159	147,971	24,350	186,742	59,542	413,605	145	42	16
March 18, 1908.....	160	103,509	25,122	119,205	49,206	297,042	533	151	250
February 19, 1908.....	161	113,776	30,088	134,217	44,432	322,513	697	141	249

in the aggregate without violating the act. He alleges that for these reasons the law is discriminatory and invalid.

The Union Pacific, the Oregon Short Line, the Union Pacific Coal Co. and J. M. Moore, Manager of the Union Pacific Coal Co., were fined \$2,000 each, and Everett Buckingham, a traffic officer of the Oregon Short Line, was fined \$1,000 by Judge Marshall in the federal court at Salt Lake City on March 29. The fines were imposed under the anti-trust law on charges of conspiracy to destroy the business of the T. J. Sharp Coal Co. The charge was that the railways and their officers re- fused to haul the coal of the Sharp coal company and that in so doing they acted in collusion with the Union Pacific Coal Co.

The United States Circuit Court of Appeals at St. Paul, Minn., has affirmed the sentence imposed by the lower court,

box cars, increased its coal surplus by 2,002. In group 6 (Northwestern) there are 1,608 more coal cars than on our last report, and the box car surplus increased 6,008. There is little change in the situation in the other groups."

The accompanying table shows the surpluses and shortages for the period covered by the report and the accompanying chart shows the surpluses and shortages in 1907, 1908 and 1909.

## Passenger Fares in Missouri.

Conferences were held at Jefferson City, Mo., last week be- tween Governor Hadley and Attorney-General Major and rep- resentatives of the railways in Missouri, with a view to ef- fecting a compromise of the rate litigation in that state. A

statement was issued for the Missouri lines on March 26, in which it was said that the 3-cent local ticket rate and a 2,000-mile interchangeable book at 2 cents a mile would be put in effect on April 10. It was also announced that action to test the validity of 2-cent fare laws in adjoining states would be made at once. The statement issued on behalf of the roads reads in part as follows: "The state favors a 500-mile book good upon an individual railway and for bearer at  $2\frac{1}{4}$  cents a mile. The railways offer in lieu of this a 500-mile book good over all of the railways in the state and for bearer at  $2\frac{1}{2}$  cents a mile, and upon an individual railway a 500-mile book good for owner only for  $2\frac{1}{4}$  cents a mile. The objection by the railways to the  $2\frac{1}{4}$ -cent individual railway bearer mileage book is the fact that where more than  $\frac{1}{2}$  cent difference is made between the ordinary local ticket rate and the bearer mileage rate the mileage ticket will be used by scalpers and also to reduce interstate rates. The mileage book which the railways offer would be flat  $2\frac{1}{2}$  cents. The difference would not represent a profit to both scalper, and purchaser, therefore this ticket would not be scalped. The opinion of every passenger traffic official is that the practical effect of the  $2\frac{1}{2}$ -cent statewide mileage book would be to extend the benefit of that rate to every traveler. They would be perfectly negotiable and it would be the simplest matter for individuals to secure the use of a portion of a book held by another."

#### Denver Rate Decision Pleases Nobody.

The decision of the Interstate Commerce Commission in the case of George J. Kindel v. the New York, New Haven & Hartford et al., an abstract of which is given under Interstate Commerce Commission, by which class freight rates from eastern points to Denver were ordered reduced, does not seem to have pleased anybody. Mr. Kindel has given to the Denver papers an interview in which he says that he did not ask or care for a reduction from Chicago to Denver; a 12 per cent. reduction from Chicago to Denver was ordered. Mr. Kindel asked for a reduced rate from Missouri river points to Denver and said that he did not see why the commission gave any reduction at all if it could not do better by Denver than it did. He says he will appeal from the decision to the United States Supreme Court and even talks of instituting impeachment proceedings against members of the Interstate Commerce Commission. The decision shows, he asserts, that Denver need no longer hope for justice from the commission. The Denver Chamber of Commerce and Board of Trade has adopted a resolution in which it says:

"The principle as laid down in the Missouri river rate case and Kindel case is destructive to now recognized centers. This principle should be affirmed by the courts before being recognized as a basis for readjustment of rates. Denver interests desire that application for restraining order be made until courts can act."

This resolution was telegraphed to U. S. Senator C. J. Hughes, of Colorado, in Washington. The Denver commercial organizations have asked the railways to fight the decision in the Denver case as they are now fighting the decision in the Missouri river case.

Meantime the shippers at Missouri river points, who are siding with the commission in its effort to get the courts to uphold its decision in the Missouri river case, are denouncing the commission for its decision in the Denver case, saying that if the Denver decision is upheld it will enable jobbers at Chicago and St. Louis to drive the jobbers at Missouri river cities out of a large trade territory in western Nebraska, western Kansas, Colorado and Wyoming. A meeting of Missouri river jobbers has been called to be held in Kansas City, where a plan for resisting the decision in the Denver case will probably be decided on. The effect of the decision in the Kindel case has been discussed by traffic officers of the western lines and others, and there is little question that the roads will appeal to the courts to protect them against an enforcement of the order. The Interstate Commerce Commission has asked for a dissolution of the injunction which was issued by the Federal Circuit Court of Appeals at Chicago restraining it from enforcing its order in the Missouri river case.

## Railroad Officers.

### ELECTIONS AND APPOINTMENTS.

#### Executive, Financial and Legal Officers.

H. B. Chamberlain, Vice-President of the Erie, has resigned and his former office has been abolished.

Harry Brengle has been appointed a Traveling Auditor of the Atchison, Topeka & Santa Fe, with office at Wellington, Kan.

Horace E. Andrews, formerly President of the Cleveland Electric Railway, has been elected President of the New York State Railways.

Silas H. Strawn has been appointed the General Solicitor of the Chicago & Alton, with office at Chicago, succeeding F. S. Winston, deceased.

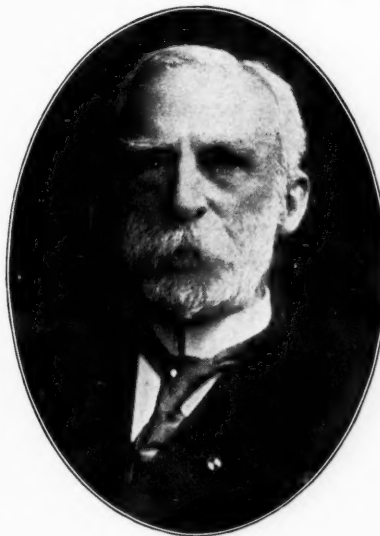
J. J. Jermyn has been elected the President of the Gulf, Texas & Western, succeeding R. C. Megargel, resigned. Mr. Megargel was elected Vice-President.

D. B. Sweeney has been appointed the Claim Agent of the Yazoo & Mississippi Valley, with office at Memphis, Tenn., succeeding Parks C. Archer, resigned.

B. F. Bush, President and Receiver of the Western Maryland, has been elected also the President of the Pittsburgh Terminal Railroad & Coal Co., succeeding F. A. Delano, resigned.

Edward M. Hyzer, Counsel of the Chicago & North Western for the state of Wisconsin, has been appointed the General Counsel, with office at Chicago, succeeding Hon. Lloyd W. Bowers, resigned to become Solicitor General of the United States. Mr. Hyzer was born in Janesville, Wis., on December 10, 1854, and received his education at the public schools. He was admitted to the bar in 1879. He has been Counsel of the Chicago & North Western for the past 11 years.

The board of directors of the Pennsylvania in view of the coming retirement of Captain John P. Green, First Vice-President, have recorded a minute giving an account of the interesting life of Captain Green, the main facts of which were published in these columns last week. The directors sum up Captain Green's work as follows: "His complete mastery of the science of sound financiering, his thorough knowledge of the finances and history of this company, his pleasing address and clear and forceful style, have made him for many years the spokesman of the management, while his general knowledge of the railway affairs and business conditions of the country have made him a prominent figure and potent factor in the



John P. Green.

debates on legislation seeking to regulate rates and other railway matters, as well as in the discussion and solution of intricate problems in accounting. Captain Green has been an executive adviser of five of the eight presidents of the company, and, when he retires from active service on July 31 next, will have served it for over 40 years, a faithful and efficient officer, and an indefatigable worker with singleness of purpose for the welfare of the company and the interests of the stockholders. The company is fortunate in the long enjoyment of his service and counsel, and the board, while regretting that the time has arrived for the severance of the

official ties which have existed for over quarter of a century, congratulate him on the completion of a service as valuable to the company as it is honorable and creditable to him, and express the hope that the evening of his active and useful life may bring him a long continuance of good health, and every opportunity for the fullest enjoyment of his well-earned freedom from exacting cares and responsibilities.

#### Operating Officers.

Samuel C. Stickney, General Manager of the Chicago Great Western, has resigned to engage in other business.

E. P. Eppes has been appointed the General Manager of the Gainesville Midland, with office at Gainesville, Ga., succeeding E. L. Douglass, resigned.

Richard S. Thompson has been appointed the Superintendent of the Mountain division of the Kansas City, Mexico & Orient, with office at Creel, Chihuahua, Mex., succeeding Edward Harrison, resigned.

W. C. Ashcraft, Trainmaster of the Middle division of the Atchison, Topeka & Santa Fe, has been appointed a Trainmaster on the Belen cut-off, with office at Vaughn, N. Mex. His successor has not been appointed.

L. R. Taylor, Superintendent of the Third division of the Virginian Railway, with office at Roanoke, Va., has been appointed the Superintendent of the Third and Deepwater divisions, with office at Princeton, W. Va., succeeding as Superintendent of the Deepwater division O. B. Johnson, resigned.

Major Charles Hine, the well-known railway official, since July, 1908, the organization expert of the Harriman Lines, with the title of "special representative" on the staff of the Director of Maintenance and Operation, Chicago, is a native and citizen of Vienna, Va., a suburb of Washington, D. C. He was born March 15, 1867; graduated, 1885, from Washington (D. C.) High School, and entered the employ of a contractor. In a competitive examination at Alexandria, Va., he won a cadetship and graduated from the U. S. Military Academy at West Point in 1891. Graduated from Cincinnati Law School and was admitted to the bar in 1893, while serving as lieutenant in the U. S. Army. He resigned his commission in 1895 and began railway work as freight brakeman on the Cleveland, Cincinnati, Chicago & St. Louis. He has worked as brakeman, switchman, yardmaster, conductor, chief clerk, Trainmaster, Assistant Superintendent, Right of Way Agent and as General Superintendent, besides holding various unique staff positions, while doing special work for numerous railways and other corporations. He has made reports on divers features of several small railways and of the following larger ones: Chicago & Alton; Chicago, Rock Island & Pacific; St. Louis & San Francisco; Chicago & Eastern Illinois; Chicago, Burlington & Quincy; Erie; Delaware & Hudson; Intercolonial; Prince Edward Island; Union Pacific System-Southern Pacific Co.

He served in the siege of Santiago de Cuba, Spanish-American war, 1898, as major, U. S. Volunteers. In 1900 he was inspector of safety appliances for the Interstate Commerce Commission. While with Gunn, Richards & Co., 1907, he assisted in the revision of business methods of the Department of the Interior at Washington. In 1907 and 1908 he acted as receiver of the Washington, Arlington & Falls Church (Electric) Railway. He is an editorial and magazine writer, and, in Virginia, a farmer and real estate dealer. Author of "Letters from an Old Railway Official to His Son," *The*

*Railway Age*, Chicago, 1904, and is the originator of "The Hine System of Organization," which, among other special duties, he is engaged in installing on the Harriman Lines as described in the *Railroad Age Gazette* of January 22, 1909.

That part of the Lincoln division of the Chicago, Burlington & Quincy east of and not including Lincoln, Neb., will be operated, after April 15, as the Omaha division. E. Flynn, Assistant Superintendent, with office at Lincoln, Neb., has been appointed the Superintendent of the Omaha division; J. P. Austin, Trainmaster at Omaha, Neb., has been appointed the Trainmaster, and J. T. McShane has been appointed the Chief Dispatcher, all with office at Omaha.

Elisha Lee, Principal Assistant Engineer of the Philadelphia, Baltimore & Washington, has been appointed the Superintendent of the New York, Philadelphia & Norfolk, succeeding J. G. Rodgers, who becomes the Assistant to the General Manager of the Pennsylvania. Mr. Lee was born September 24, 1870. He graduated from the Massachusetts Institute of Technology in 1892, and began railway work on the Pennsylvania in November, 1892, in the office of the Assistant Engineer of the Tyrone division. He has served through the various grades of Assistant Supervisor, Supervisor, Assistant Engineer and Principal Assistant Engineer. Before becoming Principal Assistant Engineer of the Philadelphia, Baltimore & Washington he had been Assistant Engineer of the Philadelphia Terminal division.

#### Traffic Officers.

J. N. Tittmore, General Traffic Manager of the Pere Marquette, has resigned.

A. Hillman has been appointed a Division Agent of the Chicago, Rock Island & Pacific, with office at Cedar Rapids, Iowa.

George F. Miller has been appointed a General Agent of the Yosemite Valley and the Yosemite Stage & Turnpike Co., with office at Los Angeles, Cal.

H. W. Prickett has been appointed a Commercial Agent of the Minneapolis & St. Louis and the Iowa Central, with office at Salt Lake City, Utah.

P. H. Kennedy has been appointed a General Agent of the Pittsburgh & Lake Erie, with office at Pittsburgh, succeeding Captain W. L. Hager, deceased.

C. T. Chapman, Assistant General Freight and Passenger Agent of the Toledo & Western, has been appointed the Traffic Manager, with office at Toledo, Ohio.

David L. Gray, Assistant General Freight Agent of the Erie, has been appointed the Assistant General Traffic Manager, with office at Chicago. This office is a new one.

E. J. Tuttle has been appointed the General Freight and Passenger Agent of the Argentine Central, with office at Denver, Colo., succeeding C. A. Johnson, resigned.

Ransom M. Calkins, General Freight and Passenger Agent of the Chicago, Milwaukee & Puget Sound, has been appointed the Traffic Manager, with office at Seattle, Wash.

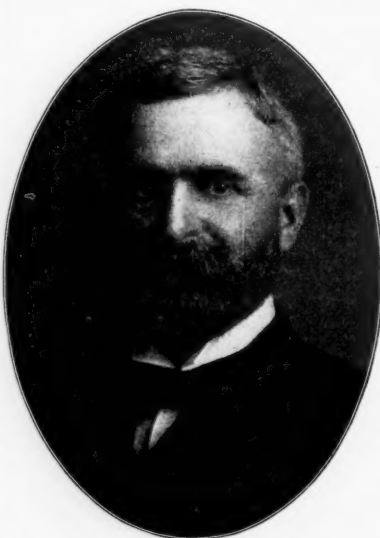
C. B. Fisk has been appointed a Division Freight Agent of the Chicago Great Western with office at Fort Dodge, Iowa, succeeding M. E. Newell, resigned to engage in other business.

T. A. Helm, Traveling Freight Agent of the St. Louis, Iron Mountain & Southern, has been appointed a Commercial Agent, with office at Dallas, Tex., succeeding H. J. Owens, resigned.

J. N. Chandler, General Agent of the Louisville & Nashville at St. Louis, Mo., has been appointed a Traveling Freight Agent, with office at Evansville, Ind. George S. Burnam, Contracting Freight Agent at St. Louis, succeeds Mr. Chandler.

W. W. Johnson, Chief Claims Clerk of the Canadian Northern Quebec and the Quebec & Lake St. John, has been appointed the Contracting Agent, with office at Quebec. H. McDonald succeeds Mr. Johnson, with office at Quebec. G. E. Beekman has been appointed the New England Passenger Agent, and E. T. Tarbox a Traveling Passenger Agent, both with office at Boston, Mass.

W. L. Kingman, Industrial Agent of the New York Central & Hudson River, has resigned, and correspondence in regard to industrial matters should hereafter be addressed to R. C.



Charles Hine.

Caples, General Agent, Traffic department, Grand Central Station, New York.

Delos W. Cook, General Traffic Manager of the Erie, heretofore with office in Chicago, now has his headquarters at 50 Church street, New York, succeeding to the duties of H. B. Chamberlain, Vice-President, hitherto at the head office of the traffic department, who has resigned.

L. H. McCormick, Traveling Passenger Agent of the St. Louis & San Francisco, has been appointed a District Passenger Agent, with office at Pittsburgh, Pa., succeeding George S. Pentecost, resigned to go with another road. Joseph M. Gittings succeeds Mr. McCormick, with office at Pittsburgh.

W. H. Abel, Assistant General Passenger Agent of the Toledo, St. Louis & Western and the Chicago & Alton, has been appointed an Assistant General Passenger Agent, with office at St. Louis, Mo., succeeding David Bowes, Chief Assistant General Passenger Agent, who resigned to become General Manager of the Judson Excursion & Freight Forwarding Co. C. R. Murray, Division Passenger Agent at Springfield, Mo., succeeds Mr. Abel, with office at Kansas City, Mo.

Edward A. Donnelly has been appointed a Traveling Freight Agent of the Chicago, St. Paul, Minneapolis & Omaha, with office at Grand Forks, N. Dak., succeeding Frederick C. Lang, promoted. He will have charge of freight traffic in the states of Minnesota and North Dakota west of Brainerd and Cass Lake, Minn.; on the north of the Northern Pacific from Brainerd, Minn., to Apple Creek, N. Dak.; east of and including Minot, N. Dak., on the Great Northern, and Portal, N. Dak., on the Minneapolis, St. Paul & Sault Ste. Marie, including the Minnesota & International and the Big Fork & International Falls; also Rainy River, Ont.

The offices of the Seaboard Air Line, the Seaboard Despatch and the Seaboard-Savannah Line at Philadelphia have been abolished, and William V. Massey, Commercial Agent of the Seaboard-Savannah Line, has been appointed a General Agent of the Seaboard Air Line, with office at Philadelphia. He will have charge of freight traffic to and from Philadelphia territory via all fast freight lines operating over the Seaboard Air Line. William J. Kirkpatrick, Commercial Agent of the Seaboard Despatch, has been appointed a Traveling Freight Agent of the S. A. L.; James A. Henderson has been appointed a Soliciting Freight Agent, and Earle B. Gunkle a Soliciting Freight Agent, all with office at Philadelphia and all reporting to Mr. Massey.

Clyde W. Colby, recently appointed General Pacific Coast Agent of the Erie, with office at San Francisco, was born in 1862 at Marshall, Mich. After a high school education at Chicago he began railway work in 1886 in El Paso, Tex. In April, 1888, he became Chief Clerk to the Traffic Agent of the International of Mexico, and in 1889 he was made Contracting Agent of the Union Pacific at Los Angeles, and a year later became General Agent of the Chicago, Milwaukee & St. Paul at Los Angeles. During 1891 and part of 1892 he was out of railway work, but in June was appointed Commercial Agent of the Rio Grande Western at San Francisco. In May of the next year he was made representative in Mexico of the Fruit Growers' Express, and in March, 1896, became Pacific Coast Agent of the Erie Despatch, and the following year was made General Agent of the Erie at San Francisco, Cal. In August, 1907, he was appointed Commercial Agent of the Erie Despatch at Chicago, which position he held until his recent appointment.

#### Engineering and Rolling Stock Officers.

W. P. Chrysler, Superintendent of Motive Power of the Chicago Great Western, has been appointed the Assistant Superintendent of Motive Power and Machinery, with office at Oelwein, Iowa.

G. A. McCarthy, Chief Engineer of the Temiskaming & Northern Ontario, has resigned and is to become connected with the firm of Smith, Kerry & Chase, Consulting Engineers, Toronto, Ont.

That part of the Lincoln division of the Chicago, Burlington & Quincy, east and not including Lincoln, Neb., will be operated, after April 15, as the Omaha division. E. D. Andrews, Master Mechanic at Sterling, Col., has been appointed the Master

Mechanic of the Omaha division; F. A. Hedengren, Master Carpenter at Lincoln, Neb., has been appointed the Master Carpenter, both with office at Omaha.

S. E. Kildoye, Master Mechanic of the Vera Cruz & Isthmus, has resigned, and his position has been abolished. J. A. Baker, General Foreman, has been appointed the Foreman of shops and locomotive repairs, with office at Tierra Blanca, V. C., Mex., and reports to the Acting Superintendent.

William H. Fenley, whose appointment as Signal Engineer of the Chicago Great Western has been announced in these columns, was born at Greenwood, Ind., on May 7, 1876. He received his education in the public and high school and later took a special course in a correspondence school. He began railway work in March, 1894, as agent's helper on the Cleveland, Cincinnati, Chicago & St. Louis. In 1896, he was appointed Yard Clerk at Greensburg, Ind., and later was made night yardmaster. On May 15, 1898, he became connected with the National Switch & Signal Co., helping in the construction of its new plant at Greensburg, Ind., and after completion of the plant he remained in charge of the tower. From June, 1899, to June, 1900, he was engaged in newspaper and advertising work part of the time and maintaining interlocking apparatus on the Cleveland, Cincinnati, Chicago & St. Louis the rest of the time. In June, 1900, he began work with the Chicago Great Western as a fitter in a construction gang; later he was engaged in the installation and maintenance of electrical and mechanical apparatus. In October, 1906, he was appointed Signal Supervisor, which position he held until his appointment as Signal Engineer on February 24.

Wilson E. Symons has been appointed the Superintendent of Motive Power and Machinery of the Chicago Great Western. Mr. Symons was born at Farmland, Ind., on December 18,



W. E. Symons.

1858. He received his education at Dublin Academy in Eastern Indiana. He began railway work in 1880 as a machinist on the Chicago, Rock Island & Pacific at Chicago. In 1881 he was made Chief Engineer of the Merchant Marine service on the Great Lakes. From 1885 to 1887 he was a locomotive fireman and engineer and did some special expert work on the Wisconsin Central. From 1887 to 1889 he was a locomotive engineer on the Atlantic & Pacific, now a part of the Atchison, Topeka & Santa Fe, and also did some special engineering work in California and Arizona. During 1889 he was engaged in special and Electrical Engineering work in Chicago. In 1890 he was appointed General Foreman of the Atchison, Topeka & Santa Fe at Chanute, Kan., and in 1892 Master Mechanic at Raton, N. Mex. In 1896 he was made Master Mechanic of the Mexican Central at San Luis Potosi, Mex., and in the same year was appointed Mechanical Expert and Salesman of the Galena-Oil Co., Scranton, Pa., in the United States, England and France. In July, 1898, he was appointed Superintendent of Motive Power and Equipment of the Plant System Railways at Savannah, Ga. In May, 1902, he was made Mechanical Superintendent of the Gulf, Colorado & Santa Fe, and in August, 1904, Superintendent of Machinery of the Kansas City Southern. From 1905 to 1909 he has been engaged in special expert and consulting railway work in Chicago. Mr. Symons is a member of and a contributor to the Western Society of Engineers, the American Society of Mechanical Engineers, American Railway Master Mechanics' Association, Master Car Builders' Association and Franklin Institute. His headquarters will be at St. Paul, Minn.

**Purchasing Officers.**

C. R. Craig has been appointed the Purchasing Agent of the Mobile & Ohio, with office at Mobile, Ala., succeeding R. H. Duesberry, resigned.

**OBITUARY.**

John C. Kennedy, Purchasing Agent of the Nashville, Chattanooga & St. Louis, died of heart failure on March 17. He was 58 years old.

J. T. Young, formerly Superintendent of Bridge Construction of the Detroit, Toledo & Ironton, died March 21 at Greenfield, Ohio. He was 62 years old and had retired from railway work about a year previous to his death.

William C. Barnes, Passenger and Ticket Agent of the St. Louis, Iron Mountain & Southern at Little Rock, Ark., died suddenly on March 23 at St. Louis, Mo. He had been connected with the Missouri Pacific-Iron Mountain System for 22 years.

Thomas Fitzgerald, General Manager and Receiver of the Norfolk & Southern, died at Baltimore, Md., on March 28, after a long illness from stomach trouble. He was born January 1, 1853, at Fairmount, W. Va., and began railway work in 1866 on the Baltimore & Ohio as water boy. A year later he became telegraph messenger boy at Fairmount, and in 1868 worked as telegraph operator at various places. By March, 1873, he had become Night Despatcher at the Camden station and a year later was made Train Despatcher on the Washington and Alexandria branches. By 1879 he had become Superintendent of trains on the Harper's Ferry, Valley and Washington county branches, and two years later was appointed Train Master of the Ohio divisions. In 1883 he was promoted to Master of Transportation of the Trans-Ohio division. After three years of work on this division he was promoted to Superintendent of the Central Ohio, Lake Erie and Straitsville divisions, and later in the same year, 1886, was made Superintendent of the Eastern division. In 1893 he was appointed Superintendent of Transportation and the next year also General Superintendent of main stem and branches of the Philadelphia division, with office at Baltimore, Md. In 1899 he was appointed General Superintendent of the Baltimore & Ohio, and in February, 1905, was made General Manager. Later he left the Baltimore & Ohio to become General Manager of the Norfolk & Southern.

Cyril C. Harvey, until August, 1907, President of the New Orleans & Northeastern, the Alabama & Vicksburg and the Vicksburg, Shreveport & Pacific, died at his home in East Molesey, Surrey, England, on March 25. He was born near St. Johns, Newfoundland, in 1846. He began railway work in 1864 in the Accountant's office of the London, Brighton & South Coast, in England. From 1865 to 1882 he held various positions in the offices of the General Manager, Superintendent, Accountant and Auditor. In 1882 he was made Assistant General Manager. In 1883 he was appointed Assistant General Manager of the Cincinnati, New Orleans & Texas Pacific and associated lines. In 1885 he was made Comptroller, and in 1887 Vice-President. In 1894 he was elected President of the three companies first above named, which position he held until his retirement from active service in August, 1907.



Thomas Fitzgerald.

**Railroad Construction.****New Incorporations, Surveys, Etc.**

**CANADIAN PACIFIC.**—Contract let to John Dutton, contractor, Winnipeg, Man., for a 20-mile branch west from Weyburn, Sask.

Contract let to Foley, Welch & Stuart, contractors, Winnipeg, Man., for a 20-mile section from Lethbridge, Alb., eastward.

Contract let to Foley, Welch & Stuart, Winnipeg, Man., for a branch in Alberta from Lacombe east to Stettler, 51 miles. (March 12, p. 523.)

**CHAMBERSBURG, GREENCASTLE & WAYNESBORO (ELECTRIC).**—According to press reports, this company will build an extension from Chambersburg, Pa., northeast towards Shippensburg.

**CHEMICAL & HELVETIA.**—Organized in West Virginia, with \$25,000 capital, and headquarters at Helvetia, to build a line in Upshur and Randolph counties from a point near Chemical station, on the Baltimore & Ohio, to Helvetia, W. Va. The incorporators include H. G. Young, Charleston, W. Va.; J. M. N. Downes and E. Brown, Buckhannon, W. Va.; Wm. McDode, Shelbyville, W. Va.; P. H. Schaffner, Falls Creek, Pa., and C. Mudge, Olean, N. Y.

**DAYTON, LEBANON & CINCINNATI.**—Building from Dayton, Ohio, south to Lebanon, to a connection with the Cincinnati, Lebanon & Northern, which is in operation from Lebanon north, 27 miles. Contracts are to be let shortly to complete the line to Dayton. (March 19, p. 653.)

**DENVER, LARAMIE & NORTHWESTERN.**—Grading for the first 42 miles out of Denver, Colo., including a 700-ft. trestle at Sand Creek (Denver), has been practically completed. Track laying out of Denver, which was started early last winter, was discontinued after the completion of 12 miles on account of severe weather, but this work will be resumed about April 1 and be pushed as rapidly as possible to the coal fields of Wyoming, 216 miles from Denver, the first objective point.

**DULUTH, WINNIPEG & PACIFIC.**—Incorporated in Minnesota with \$100,000 capital stock to build from Virginia, Minn., south to Duluth, thus connecting the Duluth, Rainy Lake & Winnipeg, which is controlled by the Canadian Northern, with Duluth. The directors include W. H. Cook, Pres., Duluth; J. L. Washburn, W. B. Bailey, L. I. Feetham and J. F. Walsh.

**ENID, OCHILTREE & WESTERN.**—Organized to build from Enid, Okla., west via Ochiltee, Tex., and Hanford to Dalhart, about 265 miles. Surveys made and rights of way secured. A. E. Wiest, Jr., Vice-Pres. and Gen. Mgr., Dalhart, Tex., is quoted as saying that construction work from Dalhart, east, is to be begun early in April. (March 19, p. 653.)

**FINDLAY & MARION (ELECTRIC).**—According to press reports, contracts are to be let soon to build from Findlay, Ohio, south-east via Mt. Blanchard, Forest and Marseilles, to Marion, 45 miles. It is expected that work will be begun this month. G. E. Meeker, Columbus, Ohio, and H. P. Hankey, Detroit, Mich., are interested.

**GOOSE LAKE & SOUTHERN.**—See Southern Pacific.

**IOWA & OMAHA SHORT LINE.**—Construction will begin on the line between Council Bluffs, Iowa, and Treynor, 15 miles, early this spring. Contract given to George W. Adams & Co., Walnut, Iowa, on March 23.

**KANSAS CITY, MEXICO & ORIENT.**—According to press reports, the concession granted by the Mexican government has been extended three years. The additional time was granted to complete the unfinished sections through Mexico from Falmir north to the Rio Grande, and from Sanchez southwest to Las Hornillos. (March 19, p. 655.)

**KINGFISHER, COLORADO & GULF.**—Organized to build from Oklahoma City northwest to a point in New Mexico. According to press reports, surveys have been made and grading work is to be begun within 60 days. J. M. McDonald, Pres., New York; W. W. Bonser, Treas., and J. M. Cunningham, Sec.

## Railroad Financial News.

**MARIETTA & LAKE.**—Incorporated in Ohio with \$1,000,000 capital to build from Lore City, Ohio, east, thence north to Freeport, about 30 miles. According to press reports a contract has been signed with the Moorehead Construction Co., and work is to be begun shortly. E. P. Strandburg, Pres., Cambridge, Ohio. (Feb. 26, p. 435.)

**NEW ORLEANS GREAT NORTHERN.**—According to press reports, this company has extended its service north, 56 miles, to Hopewell, Miss. It is expected that the line will be in operation north to Jackson, about 20 miles additional, early in May. (March 19, p. 656.)

**NEW YORK CONNECTING.**—According to a press despatch from New Haven, the New York, New Haven & Hartford has acquired all the land needed in connection with the proposed bridge across the East river and Ward's and Randall's islands, New York, to be built by the New York Connecting Railroad, and conferences are being held between officers of the New Haven company and the Pennsylvania. (March 19, p. 657.)

**NEW YORK, NEW HAVEN & HARTFORD.**—See New York Connecting.

**OKLAHOMA, VERNON & TEXAS.**—An officer writes that the present plans call for a line from Vernon, Tex., westerly through the counties of Wilbarger, Foard, Cottle, King and Dickens to a point in Crosby county, about 125 miles. Preliminary surveys being made. L. G. Hawkins, Pres., and A. J. Robinson, Ch. Engr., Vernon. (March 26, p. 727.)

**PENNSYLVANIA.**—See New York Connecting.

**PHILADELPHIA & READING.**—Bids are wanted April 6 by W. Hunter, Ch. Engr., Philadelphia, Pa., for work in connection with the elimination of grade crossings on the Philadelphia, Germantown & Norristown, as follows:

Contract No. 20 includes material for permanent tracks from Berks street to Broad street.

Contract No. 36, for fences, gates, etc., at York street and Narrow street yards; raising Huntingdon street foot bridge, etc.

**PHILADELPHIA, GERMANTOWN & NORRISTOWN.**—See Philadelphia & Reading.

**SONORA CENTRAL.**—According to press reports from Mexico City, the American interests which own the Cieneguita copper mines in the Sahuaripa district, state of Sonora, Mex., are organizing a company and making surveys to build from Toniche, in the Yaqui river valley, to Sahuaripa. The new line is to furnish an outlet for the mines and will connect, at Toniche, with the branch of the Cananea, Yaqui River & Pacific, now building up the valley.

**SOUTH BETHLEHEM & SAUCON.**—According to press reports, work is to be started at once on an extension from Colesville, Pa., south to Center Valley, about five miles. At Center Valley connection is to be made with the Lehigh Valley Traction Co., furnishing a direct route to Philadelphia from South Bethlehem, 15 miles shorter than the old route via Allentown.

**SOUTHERN PACIFIC.**—An officer writes that preliminary surveys have been made for the Goose Lake & Southern, from the California-Oregon state line on the east side of Goose Lake, south via Alturas and Eagle Lake, thence from near Prattville southwest towards Vina. The G. L. & S. was organized to build about 406 miles from Goose Lake, Cal., south. (March 19, p. 658.)

**VALDOSTA, MOULTRIE & NORTHWESTERN.**—Projected from Valdosta, Ga., northwest to Moultrie, 38 miles. Press reports indicate that contract has been given to J. W. Wright, Jr., contractor, for work to be completed within five months. (March 15, 1907, p. 393.)

**WHEELING & UNIONTOWN.**—Incorporated in West Virginia with \$10,000 capital to carry out the project under consideration for a long time to build from Wheeling, W. Va., east to Uniontown, Pa., about 60 miles. The incorporators include S. N. Noyes, A. B. Woodruff, J. M. Ritz, R. Hix and L. C. Ebeling, all of Wheeling.

**CHICAGO, ROCK ISLAND & PACIFIC.**—The \$6,000,000 6 per cent. notes dated 1906 and extended for one year in 1908 were paid at maturity April 1 at the office of Speyer & Co., New York.

**CINCINNATI, HAMILTON & DAYTON.**—Judge Lurton, of the United States Circuit Court, ruled at Cincinnati that the receivership of the Cincinnati, Hamilton & Dayton must end as soon as possible and that the road must be sold. Governor Judson Harmon was asked to continue as receiver until May 1. Judge Lurton refused the petition of the Brooklyn Trust Co. and others to intervene in legal proceedings against the road.

**DULUTH, RAINY LAKE & WINNIPEG.**—See Duluth, Winnipeg & Pacific under Railroad Construction.

**ERIE.**—The coupons due April 1 on various issues of Erie bonds were paid at the offices of the company by the Erie and were not sold to J. P. Morgan & Co. as had been done with other maturing coupons three months ago and for some time before that. (June 19, 1908, p. 210.)

**GENEVA, CORNING & SOUTHERN.**—The stockholders of the Syracuse, Geneva & Corning, the Fall Brook Railway and the Pine Creek Railway voted on March 16 to consolidate these companies under the name of the Geneva, Corning & Southern with an authorized capital stock, all of which is outstanding, as follows: Common, \$2,325,000; preferred 4 per cent. cumulative, \$5,000,000, and with no bonds. The new company will own about 230 miles of railway, which is leased to the New York Central & Hudson River. See New York Central & Hudson River.

**GRAND TRUNK PACIFIC.**—President Hays is quoted as saying that the cost of the 916 miles of the prairie section will be \$32,198,351, or about \$35,151 per mile. Up to September 3, 1908, \$24,087,743 had been spent.

**GREAT NORTHERN.**—The premiums offered for exchange of the bonds of the St. Paul, Minneapolis & Manitoba for consolidated mortgage 4 per cent. bonds of the Great Northern will be reduced on April 1 from \$5 to \$4 on each \$1,000 second mortgage bond, and from \$15 to \$14 on each \$1,000 Dakota extension bond.

**MANISTEE & NORTH-EASTERN.**—Devitt, Tremble & Co. and A. B. Leach & Co., Chicago, are offering \$1,015,000 5 per cent. bonds dated January 1, 1909, due \$40,000 annually beginning January 1, 1912, at a price to yield 5¼. The company owns railway running from Manistee, Mich., to Traverse City, with branches, making a total mileage of 184 miles. The total authorized issue of bonds is \$1,500,000, of which \$485,000 are reserved for the purchase of future equipment and improvements.

**MISSOURI PACIFIC.**—The *Commercial and Financial Chronicle*, New York, says: "It is understood that a new mortgage is in contemplation under which bonds will be issued to provide for the company's requirements, both present and future. Details as to the nature of the bonds, the interest rate, and so on, have not yet been determined. The flotation of the first issue, it is said, will be through Kuhn, Loeb & Co., New York."

**NEW YORK CENTRAL & HUDSON RIVER.**—Stockholders are to vote on April 21 on approving a lease of the Spuyten Duyvil & Port Morris for the term of the corporate existence of the company and on the lease of the Geneva, Corning & Southern, and to substitute these new leases for the existing lease under the New York Central & Hudson River's \$100,000,000 mortgage. See Geneva, Corning & Southern.

**NEW YORK, NEW HAVEN & HARTFORD.**—Kidder, Peabody & Co., Boston, Mass., are offering at 100¼ \$5,000,000 one-year 4 per cent. notes of the New York, New Haven & Hartford dated March, 1909.

**SPUYTEN DUYVIL & PORT MORRIS.**—See New York Central & Hudson River.

## Equipment and Supplies.

### LOCOMOTIVE BUILDING.

The Buffalo & Susquehanna is making inquiries for 11 consolidation locomotives.

The Buffalo, Rochester & Pittsburgh is making inquiries for 1 Atlantic, 2 decapod and 12 consolidation locomotives.

The Lufkin Land & Lumber Co., Kansas City, Mo., has ordered one locomotive from the Baldwin Locomotive Works.

The Saginaw & Flint has ordered two locomotives from the Baldwin Locomotive Works in addition to the four ordered some time ago.

The Canadian Pacific is building one articulated compound locomotive at its Angus shops, Montreal.

#### General Dimensions.

Total weight	250,000 lbs.
Cylinders	22 in. and 33 in. x 26 in.
Diameter of drivers	57 in.
Boiler, type	Straight top
Boiler, working steam pressure	180 lbs.
Heating surface, total	4,000 sq. ft.
Tubes, length	328, 9 ft. 3 in.; 401, 18 ft. 6 in.
Firebox, length	10 ft.
Firebox, width	4 ft. 11 1/4 in.
Grate area	58.3 sq. ft.
Water capacity	5,000 imp. gals.
Coal capacity	10 tons

#### Special Equipment.

Air-brakes	Westinghouse
Axles	Mild steel
Bell ringer	Little Giant
Boiler lagging	1st ring plastic asbestos, remainder sectional magnesia
Brakebeams	Simplex truss
Brakeshoes	Can. Pac. standard
Couplers	Tower
Headlight	Pyle-National, electric
Injector	Hancock
Journal bearings	Canadian Bronze Co.
Piston and valve rod packings	Lewis & Kunzer
Safety valve	World
Sanding device	Leach
Sight feed lubricator	Detroit, 7-feed
Springs	Can. Pac. standard crucible steel
Steam gages	Star, vertical reading hand
Wheel centers	Cast steel

The Minneapolis & St. Louis, as reported in the Railroad Age Gazette of March 26, has ordered 14 locomotives from the Baldwin Locomotive Works. Of these 7 are simple consolidation freight locomotives, 4 simple 10-wheel passenger locomotives and 3 simple Mogul switching locomotives. The consolidation and 10-wheel locomotives will be equipped with Walschaerts valve gear and the switching locomotives with the Stevenson link.

#### General Dimensions.

	Consolidation.	10-wheel.	Switching.
Number	7	4	3
Weight on drivers	150,000 lbs.	145,000 lbs.	138,000 lbs.
Total weight	172,000 "	182,000 "	157,000 "
Cylinders	21 in. x 30 in.	21 in. x 26 in.	20 in. x 28 in.
Diameter of drivers	60 in.	68 in.	51 in.
Boiler, type	Straight top.	Ext. wgn top.	Straight top.
" wkg. stm. press.	200 lbs.	66 3/4 in.	190 lbs.
" diam. smst ring	66 3/4 in.	2,490 sq. ft.	72 in.
Heating surf., tubes	2,717 sq. ft.	2,490 sq. ft.	1,778 sq. ft.
" " firebox	144 "	164 "	177 "
" " total	2,861 "	2,654 "	1,955 "
Grate area	46.0 "	47.7 "	31.2 "
Tubes, number	326	318	311
" diameter	2 in.	2 in.	2 in.
" length	16 ft.	15 ft. 1/2 in.	11 ft.
Tender, style	Water bottom.	Water bottom.	Sloping back.
Tender, truck	Bar frames.	Bar sides.	Andrew C.S.
Water capacity	6,000 gals.	6,000 gals.	5,000 gals.
Coal capacity	12 tons.	10 tons.	8 tons.

#### Special Equipment.

Bell ringers	Simplicity
Blow-off valves	Bordo
Boiler covering	Sectional magnesia lagging
Boiler steel	Homogeneous
Brakes	New York
Brake-shoes	Undecided
Couplers	Simplex
Driving wheel centers	Cast steel
Firebox steel	Otis
Headlights	Wabash all-steel
Injectors	Ohio and Monitor
Journal bearings	Damascus bronze
Lubricators	Nathan
Metallic packing	Jerome
Safety valves	Coale
Sanding device	"She"
Tires	American O. H. steel
Valves	American balanced

The Chicago, Burlington & Quincy, as reported in the Railroad Age Gazette of March 12, has ordered 25 simple Pacific locomotives from the Baldwin Locomotive Works for May and June delivery.

#### General Dimensions.

Cylinders	88 in. x 28 in.
Diameter of drivers	74 in.
Boiler, working steam pressure	200 lbs.
Firebox, length	108 1/4 in.
Firebox, width	72 1/4 in.
Tubes, number	293
" diameter	2 1/4 in.
" length	21 ft.
Tender, style	Special low design
" truck	Equalized pedestal type
" water capacity	8,000 gals.
" coal capacity	13 tons

The Canadian Pacific is building 10 ten-wheel locomotives at its Angus shops, Montreal.

#### General Dimensions.

Weight on drivers	141,000 lbs.
Weight, total	190,000 lbs.
Cylinders	22 1/2 in. x 28 in.
Drivers, diameter	63 in.
Boiler, type	Wagon top.
Boiler, working steam pressure	180 lbs.
Heating surface	2,418 sq. ft.
Tubes, number and diameter	(240) 2-in.; (24) 5-in.
Tubes, length	14 ft. 3 in.
Firebox, length	8 ft. 6 1/4 in.
Firebox, width	5 " 9 1/2 "
Grate area	49 sq. ft.
Water capacity	5,000 imp. gals.
Coal capacity	10 tons.

#### Special Equipment.

Air-brakes	Westinghouse
Axles	Mild steel
Bell ringer	Little Giant
Boiler lagging	1st ring plastic asbestos, remainder Kerr's air cell.
Brake-beams	Simplex
Brake-shoes	Canadian Pacific standard
Couplers	Tower
Headlight	Pyle-National electric
Injector	Hancock
Journal bearings	Canadian Bronze Co.
Piston and valve rod packings	Lewis & Kunzer
Safety valve	World
Sanding device	Leach
Sight-feed lubricator	Detroit, 5-feed
Springs	Can. Pac. standard, crucible steel
Steam gage	Star, vertical reading hand
Tender wheels	Solid, rolled steel
Wheel centers	Cast steel
Superheater	Vaughan-Horsely

The New York, Chicago & St. Louis, reported in the Railroad Age Gazette of February 26 as being in the market for 10 simple 10-wheel and 5 simple six-wheel switching locomotives, has placed this order with the American Locomotive Co. This equipment will be built at the Brooks works for delivery in August. The 10-wheel locomotives will be equipped with Walschaerts and the switching engines with Stephenson gear.

#### General Dimensions.

	10-wheel.	6-wheel switch.
Weight on drivers	106,300 lbs.	105,000 lbs.
Total weight	140,500 "	105,000 "
Cylinders	19 in. x 24 in.	18 in. x 24 in.
Diameter of drivers	62 in.	50 in.
Boiler, type	Ext. wagon top.	Straight top.
" wkg. steam press.	180 lbs.	170 lbs.
" diam. smst ring.	58 3/4 in.	56 in.
Heating surface, tubes	1,655 sq. ft.	990 sq. ft.
" " firebox.	128 "	131 "
" " total	1,783 "	1,121 "
Tubes, number	239	172
" diameter	2 in.	2 in.
" length	13 ft. 1/2 in.	11 ft. 1 1/8 in.
Firebox, length	102 1/2 in.	96 in.
" width	40 1/4 in.	33 in.
" depth	F. 71 in., B. 58 in.	F. 64 in., B. 62 in.
Grate area	28.54 sq. ft.	21.34 sq. ft.
Tender, style	Water bottom.	U-shaped.
" truck	Arch bar.	Arch bar.
" water capacity	5,500 gals.	3,000 gals.
" coal capacity	14 tons.	4.4 tons.

#### Special Equipment.

Bell ringers	Gollmar
Blow-off valves	Johnstone
Boiler covering	Keasby & Mattison
Boiler steel	Lukens
Brakes	Westinghouse
Brake-shoes	American Brake Shoe & Foundry
Couplers	Climax
Driving wheel centers	10-whl. cast-steel; 6-whl. cast-iron
Exhaust apparatus	Co. standard
Firebox, steel	Otis
Headlights	Co. standard 18 in. R. C.
Injectors	Monitor
Journal bearings	Magnus
Lubricators	Nathan
Metallic packing	United States
Safety valves	Coale
Sanding device	Leach
Springs	Railway Steel-Spring Co.
Steam gages	Crosby
Tender brake-beams	Wycott No. 2
Tires	Latrobe
Valves	Richardson
Whistles	Co. standard chime

The *Temiskaming & Northern Ontario*, reported in the *Railroad Age Gazette* of March 12, has ordered two switching locomotives from the Canadian Locomotive Co., for July delivery.

#### General Dimensions.

Total weight .....	128,000 lbs.
Cylinders .....	19 in. x 26 in.
Diameter of drivers .....	51 in.
Boiler, type .....	Radial stayed
Boiler, working steam pressure .....	200 lbs.
Tubes, number .....	223
" length .....	10 ft. 6 in.
" outside diameter .....	2 in.
Water capacity .....	45,000 Imp. gals.
Coal capacity .....	6 tons

#### Special Equipment.

Brakes .....	Westinghouse
Piston and valve rod packing .....	Metallic
Truck bolsters .....	Simplex

### CAR BUILDING.

The *St. Joseph & Grand Island* is in the market for three observation parlor cars.

The *Central Railroad of New Jersey* has ordered 15 coaches from Harlan & Hollingsworth.

The *Baltimore & Ohio* is said to be asking prices on 10,000 freight cars. This item is not confirmed.

The *Sugar Land Railway*, N. V. Truly, General Manager, Sugar Land, Tex., is in the market for a rebuilt first-class private car.

The *Long Island*, reported in the *Railroad Age Gazette* of March 5 as asking prices on 114 fifty-ton box and 20 fifty-ton gondola cars, has given this order to the Pressed Steel Car Co.

The *Wabash-Pittsburgh Terminal Railway*, reported in the *Railroad Age Gazette* of February 19 as asking prices on 200 hopper cars, has ordered 500 fifty-ton hopper cars from the Standard Steel Co.

The *Chicago, Milwaukee & St. Paul*, reported in the *Railroad Age Gazette* of February 12 as asking prices on passenger equipment, has ordered 25 coaches, 10 sleepers and 4 dining cars from the Pullman Car Co.

The *Spokane, Portland & Seattle* has ordered 5 coaches, 3 combination passenger-smoking, 2 combination baggage-express, 1 combination mail-express and 2 observation buffet cars from the Pullman Car Co.

The *Erie & Michigan Railway & Navigation Co.*, reported in the *Railroad Age Gazette* of December 18 as being in the market for 200 box cars, has not placed the order for that equipment and the matter is now being held in abeyance.

The *Vandalia* has ordered 205 freight cars for replacement account as follows: 52 hopper and 50 gondola cars from the Cambria Steel Co.; 72 box cars from the American Car & Foundry Co., and 31 stock cars from the Standard Steel Car Co.

The *Salt Lake & Ogden* (Electric), Salt Lake City, Utah, reported in the *Railroad Age Gazette* of December 25 as soon to be in the market for cars, expects to purchase twelve 56-ft. cars, six of which will be coaches and six combination passenger and baggage cars.

The *Third Avenue Railroad*, New York, was reported in the *Railroad Age Gazette* of December 18 as being in the market for 200 cars. These cars were ordered from the J. G. Brill Co., as were 75 additional cars just placed. The electrical equipments for these 75 cars were divided between the Westinghouse Manufacturing Co., which received 50, and the General Electric Co., which received 25 complete equipments.

The *New York Central Lines*, reported in the *Railroad Age Gazette* of March 12 as being in the market for passenger and freight equipment, has placed orders as follows:

New York Central & Hudson River:	
20 steel baggage-express .....	American Car & Foundry Co.
16 steel baggage-express .....	Standard Steel Car Co.
Michigan Central:	
10 steel baggage-express .....	Pullman Car Co.
Cleveland, Cincinnati, Chicago & St. Louis:	
5 steel baggage-express .....	Barney & Smith Car Co.

The *Minneapolis & St. Louis*, as reported in the *Railroad Age Gazette* of March 5, has ordered 500 wooden 30-ton box and 100 wooden 40-ton coal cars from the Mt. Vernon Car Manufacturing Co. The box cars are for delivery in April and May and the coal cars in April. The box cars will be 34 ft. 1½ in. long, 8 ft. 3 in. wide and 7 ft. 1 in. high, inside measurements, and 35 ft. ½ in. long, 8 ft. 9¾ in. wide and 12 ft. 4 in. high, outside dimensions. The coal cars will be 38 ft. 8 in. long, 8 ft. 8¾ in. wide and 4 ft. 1 in. high, inside dimensions, and 40 ft. long and 9 ft. 1¾ in. wide, outside dimensions. The box cars will weigh 32,100 lbs. and the coal cars 37,700 lbs. The special equipment will include:

Axles .....	O. H. steel
Bolsters, body and truck .....	Simplex
Brakebeams .....	Simplex
Brakeshoes .....	Streeter steel back
Brakes .....	New York
Center bearings .....	Co. standard
Couplers .....	R. E. Janney steel
Door fastenings, box cars .....	Positive
Doors, box cars .....	Security
Draft rigging .....	Farlow
Journal bearings .....	Eureka
Journal boxes .....	McCord
Paint .....	Co. standard
Roofs, box cars .....	Hutchins inside
Side bearings, box cars .....	Barber roller
Springs .....	Railway Steel-Spring
Trucks .....	Andrews side frames
Wheels .....	Mt. Vernon Car Mfg. Co.

### IRON AND STEEL.

The *Northern Pacific* is in the market for 5,000 tons of rails.

The *Philadelphia & Reading* is reported to be in the market for 10,000 tons of steel.

The *New York Central Lines* are making inquiries for about 40,000 tons of fabricated steel.

The *Minneapolis, St. Paul & Sault Ste. Marie* is in the market for 6,000 tons of rails.

The *Chicago, Milwaukee & St. Paul*, reported in the *Railroad Age Gazette* of February 12 as soon to be in the market for 40,000 tons of rails, is reported to have placed an order for 1,600 tons with the Illinois Steel Co.

The *Grand Trunk Pacific* has ordered 13,000 tons of 80-lb. rails and 2,000 tons of 60-lb. rails from the Dominion Iron & Steel Co., for delivery at Prince Rupert during the coming summer. These rails will be A. S. C. E. section.

The *Chicago & North Western*, reported in the *Railroad Age Gazette* of March 19 as being in the market for 11,000 tons of structural steel for track elevation work, has placed an order for 9,000 tons with the American Bridge Co. and for 2,000 tons with the Modern Structural Steel Co. of Waukesha, Wis.

**General Conditions in Steel.**—During the month of March, according to information gathered by the *Journal of Commerce*, New York, contracts were given for 144,420 tons of fabricated steel, of which 46,420 tons are for use in railway bridge and building construction. The all important factor in the steel business seems to be the final action on the tariff. Indications are that orders for a considerable tonnage are still being held back on this account. An officer of the Chicago & Alton is quoted as having said that close investigation of the steel rail situation disclosed no tendency to grant concessions in price even on a fair-sized order; on the contrary, manufacturers were positive that standard sections would not be cut. In this connection, it is to be remembered that a cut at this time would affect prices of rails now being rolled.

### RAILROAD STRUCTURES.

**BREWSTER, OHIO.**—The Receiver of the Wheeling & Lake Erie has made application to the courts for permission to issue receivers' certificates to the amount of \$1,429,976 for building new stations, interlocking plants, equipment supplies and making necessary renewals. It is planned to build new shops at Brewster costing \$750,000. (Dec. 4, p. 1503.)

**COLUMBUS, OHIO.**—According to press reports, the Ohio Electric Railway Co. will put up a new passenger station on

ground which it owns on South Third street, between Town and Rich streets.

DAYTON, WASH.—The Oregon Railroad & Navigation Co. may build a steel bridge over the Touchet river.

NEW YORK.—See New York Connecting under Railroad Construction.

VANCOUVER, B. C.—The head office of the Canadian Pacific at Montreal refuses to confirm the report that this company will put up new car and locomotive shops at Vancouver, B. C. (March 26, p. 729.)

#### SIGNALING.

The Chicago, Rock Island & Pacific has changed the night color indications in its fixed signals and switch targets throughout the Illinois division from Blue Island to Davenport, 167 miles. The indications now are green for clear, red for stop and yellow for caution in block and interlocking signals, and for the adverse indication of siding switches.

### Supply Trade News.

Press reports from Dunkirk, N. Y., indicate that the American Locomotive Company will build a new boiler shop at its Brooks plant.

Jasper R. Rand, of New York, vice-president of the Ingersoll-Rand Co., New York, died at St. Mark's Hospital, New York, on March 30.

The Isthmian Canal Commission is asking bids up to April 26 on hose, packing, rubber, valves, gaskets, rubber belting, etc. (Circular No. 501.)

Ezra D. Beckwith, Vice-President of the W. F. Bossert Manufacturing Co., Utica, N. Y., died suddenly of heart trouble last week. He was 70 years old.

According to a consular report a private motor car service is shortly to be started between Bukit Mertajam and Kulim, in Kedah, Straits Settlements. The car will make four round trips a day.

G. Fred Collins has resigned his position with the Gold Car Heating & Lighting Co., New York, to take charge of the railway business of John A. Crowley & Co., 120 Liberty street, New York, U. S. representatives for "Arrow" high-speed tool steel.

The Westinghouse Electric & Manufacturing Co., Pittsburgh, Pa., will furnish the electrical equipment for 50 cars, and the General Electric Co., Schenectady, N. Y., the equipment for 25, of the 75 cars recently ordered from the J. G. Brill Co., Philadelphia, Pa., by the Third Avenue Railroad, New York.

As noted in the *Railroad Age Gazette* of March 26, part of the works of the Wright Wire Co. at Worcester, Mass., were burned on March 20. The next day there was a fire at the Palmer plant. Nearly all the machinery, however, is in such shape that it can be operated, and the company is in a position to fill orders.

The American Car & Equipment Co., Chicago, announces the following changes in the officials of its company: President, H. H. Sessions; Vice-President, C. R. Powell; Secretary and Treasurer, W. H. Horine; General Sales Manager, B. B. Barry. I. J. Kusel having disposed of his holdings in the company to H. L. Winslow, formerly of Julian L. Yale & Co., Chicago, has resigned as Vice-President.

The Jones & Laughlin Steel Co., Pittsburgh, Pa., has sold to Blair & Co., New York, and the First Trust & Savings Co., Chicago, \$15,000,000 30-year 5 per cent. bonds, being part of an authorized issue of \$30,000,000. The proceeds are to be used to retire about \$2,000,000 in previous obligations, and the remainder will be used for future improvements and to reimburse the treasury for money already spent on new construction.

The Hanlon Locomotive Sander Co., Winchester, Mass., has

had its locomotive sanders specified upon the 10 consolidation, 5 Pacific and 5 switching locomotives being built by the American Locomotive Co. for the Chicago & Alton; the 16 ten-wheel locomotives being built by the same company for the Missouri, Kansas & Texas, and the 12 consolidation locomotives being built by the same company for the Wabash-Pittsburgh Terminal.

Gulick-Henderson & Co., Pittsburgh, Pa., have been awarded the contract for the inspection of a bridge to be built across the Monongahela river at Monongahela City, Pa. This work is under the charge of County Engineer J. C. Chalfant, and the construction work has been let to the Fort Pitt Bridge Works, Pittsburgh, Pa. The firm will also inspect some 30,000 all-steel wheels to be furnished the Chicago city railways and the Chicago railways to be made at the Schoen steel wheel plant of the Carnegie Steel Co., Pittsburgh, Pa.

Willis C. Squire, Consulting Engineer, has been appointed District Manager of the Central Inspection Bureau, New York, with office in the Western Union building, Chicago. The Bureau is equipped to furnish engineers for all kinds of railway, bridge and builders' equipment; it also makes a specialty of designing cars and inspecting locomotives, passenger cars and freight cars. It recently completed the inspection of 44 locomotives for the Argentine government, and is now superintending the construction of a number of freight and passenger cars for the Yueh-Han Railway, China.

Horace L. Winslow, for a number of years connected with Julian L. Yale & Co., Chicago, in general railway supply business, pipe engineering, etc., has opened an office at 730 Old Colony building, Chicago, and will handle specialties along the same lines as heretofore. A corporation with \$25,000 capital is being organized and Mr. Winslow will have some of the men formerly connected with Julian L. Yale & Co. associated with him. In addition to the old lines handled, Mr. Winslow will handle the Clark blow-off system for removing sludge from locomotive boilers and keeping them free from scale.

Julius W. Schaub, Consulting Engineer, Chicago, died on March 30, on a train en route from New York to Chicago. Mr. Schaub was born in 1859 and graduated from Washington University, St. Louis, Mo., in 1881 with C.E. degree. For the next five years he worked with C. Shaler Smith, C.E., in St. Louis. Then, until 1892, he was Chief Engineer of the Detroit Bridge & Iron Works. He then went to the Pottsville Iron & Steel Co. as Chief Engineer and Manager, and two years later became Chief Engineer and Manager of the Hamilton Bridge Works, Canada. Since 1898 he had been a consulting engineer. He was a member of the American Society of Civil Engineers.

Thomas Dales Henderson, Western Representative of James B. Sipe & Co., Pittsburgh, Pa., died on March 23 at his home in Chicago. His death came very unexpectedly and suddenly. He was at his desk on Monday in apparently his usual health and early Tuesday morning was stricken with heart failure and died before medical aid could be got. He was born in Allegheny county, Pa., in 1861. Going to Chicago in 1889 he became connected with various oil and paint manufacturing companies, having been engaged in the oil and paint business five years previously. During this period he was engaged in the manufacture of Japan oil, and at the time of his death had charge of the Chicago office of one of the largest distributors of that product.

R. H. Weatherly, Third Vice-President in charge of sales of the Scullin-Gallagher Iron & Steel Co., St. Louis, Mo., has resigned, effective April 15. Mr. Weatherly intends to remain in the railway supply business and has received several inviting propositions. He has spent nearly all his life in this field and his acquaintance is large and influential. He got his early education in the Manual Training School of Washington University, St. Louis, and after graduating in 1892 he went into the car seat business, where he remained for about six years. After this he became connected with the Safety Car Heating & Lighting Co., New York, and later resigned to go with the Shickle-Harrison-Howard Iron Co.

On the organization of the American Steel Foundries, Chicago, in 1902, he became Assistant to the Second Vice-President, with office in New York. In 1905 he was made Third Vice-President of the Scullin-Gallagher Iron & Steel Co., in charge of the Eastern district, and in February, 1907, was given charge of the entire sales of the company, with office in St. Louis.

The Bureau of Manufacturers, Washington, D. C., has an inquiry from a saw mill owner in Latin America asking for an estimate on a small electric trolley to be used in hauling cars loaded with logs and sawed timber. The estimate should cover cost of trolley, transmission wire, connections for rails, etc., f. o. b. New York City. The motor is required for a 200-volt continuous current, carrying a load of 5,000 to 7,000 lbs. dead weight, and should be reversible if possible, so as to avoid use of a switch in returning train to loading point. Track gage is 1.06 meters, laid with rails running 10 kilos (22.04 lbs.) to the meter. Correspondence should be in Spanish if possible. (Inquiry No. 3232.) Another saw mill owner in Latin America asks for an estimate of cost of a simple wire rope haulage system to handle logs and sawed timber. He has 15 h.p. available to operate the system. There is now a single track about 1,000 ft. long, with rails weighing 10 kilos to the meter, and the load to be carried will average about 6,000 lbs. Correspondence should be in Spanish if possible, and details regarding the initial cost for installation, together with facts relative to the ease and economy of operation, should be given. The inquirer has the necessary cars and requires only cable, connections, drums, etc. (Inquiry No. 3237.)

#### TRADE PUBLICATIONS.

**Pneumatic Pumps, Rock Drills and Channelers.**—The Ingersoll-Rand Co., New York, in catalogue 74-B, describes pneumatic pumping systems, and in 21-A illustrates and describes electric-air rock drills and channelers.

**Suction Conveyor.**—The Darley Engineering Co., Pittsburgh, Pa., has just issued Bulletin No. 2 on suction conveyors, which contains a large number of illustrations and an amount of instructive information on this subject.

**Mill Motors.**—The Westinghouse Electric & Manufacturing Co., Pittsburgh, Pa., has just issued Circular No. 1164, which illustrates and describes type MS mill motors for polyphase alternating currents circuits, with constant speed squirrel cage rotors.

**Train Lighting.**—The General Electric Co., Schenectady, N. Y., has just issued Booklet No. 3,757, which deals with the advantages to be derived from the use of tantalum incandescent lamps for illuminating railway coaches, also with reference to the generating outfit designed for use with train illuminating systems.

**Thermit.**—The Goldschmidt Thermit Co., New York, in a catalogue just issued, describes with a number of illustrations thermit welding of castings and forgings. The illustrations show work done on both steam railway and electric apparatus. One illustration shows a weld on a railway truck, made without disassembling the parts.

**Track Wrenches.**—The Jeffrey Manufacturing Co., Columbus, Ohio, has just issued, from its forge and foundries department, Bulletin No. 101, which contains a description, with a number of illustrations, of the Jeffrey lock-jaw track wrench. This wrench was illustrated and described in the *Railroad Age Gazette* of March 26.

**Furnaces.**—The Hawley Down Draft Furnace Co., Chicago, has issued an 80-page catalogue which describes in detail the Schwartz metal melting and refining furnaces. These furnaces use crude oil, fuel oil or gas for fuel. The publication is well illustrated with half-tones and line drawings and contains several fac-simile letters from prominent industrial companies testifying to the merits of the furnaces under different conditions.

**Vestibule Diaphragms.**—A circular just issued by Victor Labadie, 181 Live Oak street, Dallas, Tex., contains a complete description of the Labadie vestibule diaphragm recessed face plate, which is a patented device designed to eliminate personal injuries caused to passengers in placing their fingers between the face plates of vestibuled railway cars. This device was illustrated and described in the *Railroad Age Gazette* of March 26.

**Malleable and Cast Iron Pipe Fittings, Castings and Railway Supplies.**—The general steam goods catalogue for 1909 of the Illinois Malleable Iron Co., Chicago, containing 466 pages of descriptive and illustrative matter, has just been issued. The publication gives in detail the malleable and cast iron pipe fittings, steam and hot water boilers and castings of every description in gray and malleable iron manufactured by the company; also the pipe, steam fitters', engineers', gas, water works and railway supplies which it handles. It is bound in cloth and is a convenient general reference book, very complete and useful.

**Heavy Milling Machines and Hammers.**—The Niles-Bement-Pond Co., New York, has just issued two of its standard 9-in. x 12-in. catalogues printed on heavy paper. One of these describes heavy milling machines, including 24, 30, 36, 42, 48 and 60-in. horizontal milling machines; 43 and 48-in. heavy rod milling machines; the 42-in. planer type milling machine; a five-spindle type milling machine and rotary planers. The other catalogue describes double and single-frame steam hammers, double-frame steel tilting hammers, and steam and board drop hammers. Both of these catalogues contain a large number of excellent full-page half-tone illustrations and some line cuts.

**Signal Apparatus.**—The General Railway Signal Co., Rochester, N. Y., has issued a number of catalogues and bulletins calling attention to its new devices as well as its standard signal apparatus. Especial attention is called to its Model 2-A signal mechanism, which is the first universal power-operated signal designed, being operated as an interlocking signal with either dynamic or battery indication; as an automatic block signal, a.c. or d.c.; as a high or a dwarf signal; in upper or lower quadrant; on high or low voltage and at base or top of post. Bulletin No. 102 illustrates and describes its Model 5 signal. Bulletin No. 104 is devoted to relays. Model 9, Form C, is arranged so that its front contacts can be removed for cleaning without breaking the seal on the relay or in any way interfering with the adjustment of the contacts. Bulletin No. 105 describes Model 1, Form A, outlying switch lock. This device is also designed for a telephone attachment. Bulletin No. 106 describes lightning arresters, Model 1, Form A, which contains a new arrangement of parts. Bulletin No. 107 describes Model 4, Form A, universal screw release for mechanical interlocking machines designed for application to either the Saxby & Farmer or Style A machine. The only difference in application of this device is in the style of dog. Bulletin No. 108 describes the universal electric lock for mechanical interlocking, Model 5, Form A. Bulletin No. 109 describes electric lever lock, Model 4, Form A, designed for application to any of its Model 2 interlocking machines. Bulletin No. 110 describes a switch indicator, Model 9, Form A. This is a new device designed with standard parts wherever applicable. Bulletin No. 111 describes Model 9, Form A, tower indicator. This is also a new device equipped with standard parts and is a unit construction, which can be grouped on shelves or screwed to the wall. Bulletin No. 112 is devoted to the controlled manual block system.

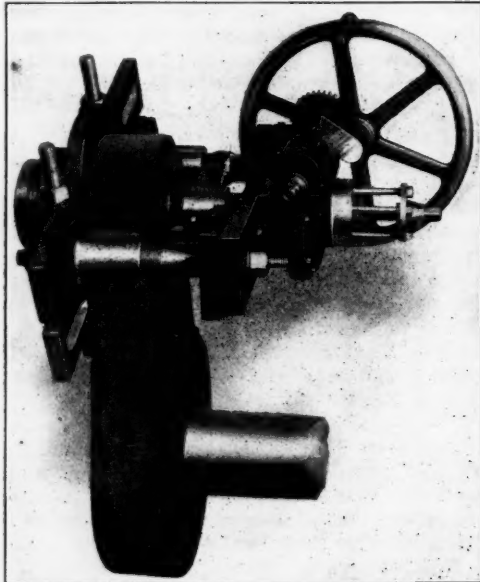
#### Underwood Universal Boring, Turning and Facing Machine.

The tool shown in the accompanying half-tone is designed principally for facing off the rivet head on crank pins, although it is also adaptable to a wide range of other work. When crank pins are riveted in countersunk holes, it is an expensive operation for a mechanic to cut away the riveted metal with a hammer and chisel in order to force out the pin.

The machine is easily set up and will, it is said, cut the metal in

about one-quarter of the time required by the other method. It is readily clamped to almost any piece of work and is then in position to bore, turn or face. The machine consists of a slotted crosshead, which forms its base, and a casing which contains a worm wheel having large integral hubs. The cutting spindle slides through the worm wheel through a range of 4 in. The feed is adjusted by hand. A steel slide is cut in the end of the spindle and the cutting tool is adjustable in this slide for different diameters by a feed screw, up to about 12 in. The two slotted V-blocks clamp the work and are pulled together by 1-in. through bolts. There are two adjustable spacing blocks threaded to receive each other, to straddle different diameters of cranks, locomotive wheels or other work. The bolts pass through the blocks and clamp the machine proper to the V-blocks.

The entire arrangement is firm and solid, and each piece being light, is easily handled by one man. The machine is quickly centered and has three changes of speeds, designed for heavy, medium or light work.



**Underwood Universal Boring, Turning and Facing Machine.**

These speeds are obtained by interchanging the gears on the driving shaft, or by driving direct without them. The spindle at right angles to the base or crosshead and through an extra heavy facing attachment, can be used for facing off pump or engine valve seats, it being immaterial whether or not the steam chest be solid or the seat be several inches below the face of the chest. The machine may be driven by hand or any other power.

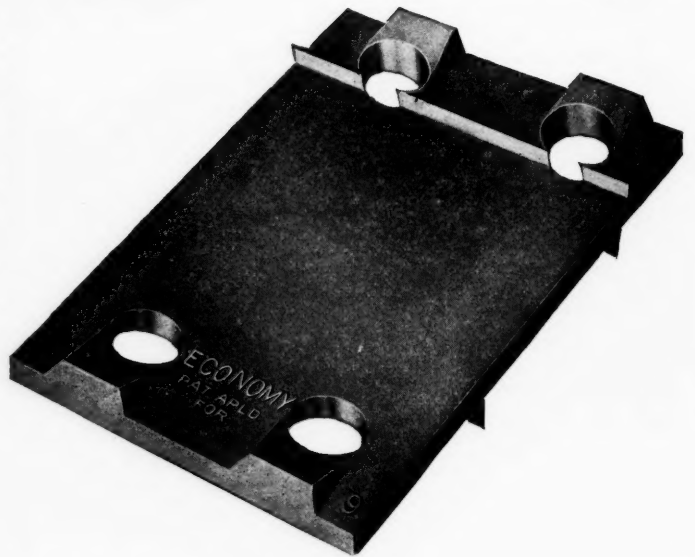
In turning off a rivet on a crank pin, it is claimed that the machine will save at least 70 per cent. of the time required for the same operation using a hammer and chisel. These machines are made by H. B. Underwood & Co., Philadelphia, Pa.

#### **"Economy" Tie Plates at the Maintenance of Way Convention.**

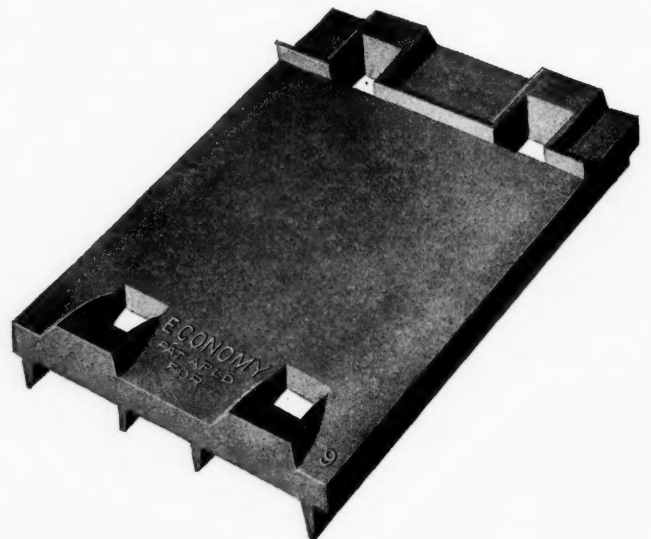
At the exhibit of railway appliances during the Engineering and Maintenance of Way convention in Chicago, the Spencer Otis Co., Chicago, exhibited several new patterns of "Economy" tie plates. These plates are rolled from open hearth steel and are designed to meet all of the conditions of tie preservation and track fastening betterments necessitated by the increased speed and weight of rolling loads.

Special attention was directed to "Economy" types 9 and 10. No. 9, shown in Figs. 1 and 2, was designed to meet the demands of screw spike users to obviate failure from distortion and bending of the spike under the head from the lateral thrust of the rail, imperfect application and non-support back of the head. These plates are made for both three and four-hole punching. The bosses or reinforcements are given the same angle as the rail base and the holes form a jig or guide for boring the holes before applying the screw spike. The user is thus assured of a good bearing of the flange or head of the spike against both rail and tie plate whether applied by hand or machine. This type of plate can always be used with driven spikes, affording reinforcement back of the head. Both of these features were demonstrated during the convention.

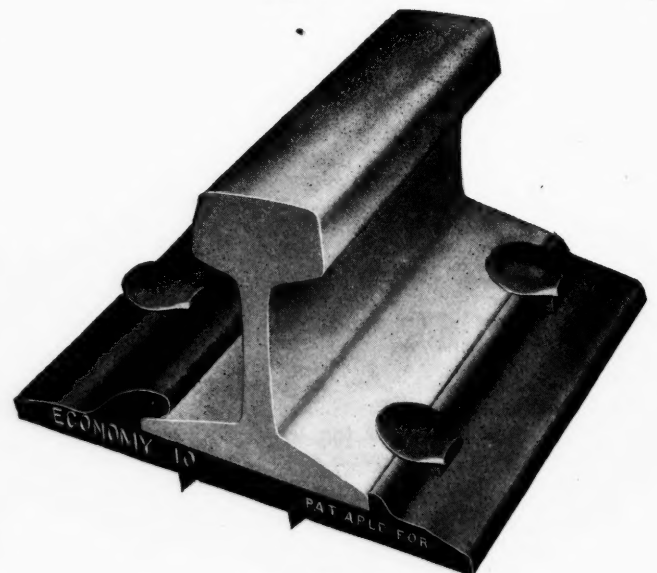
Fig. 3 shows the "Economy" No. 10 type, which is unique in design. It has an overhanging hook on the outside of the plate and a vertical shoulder on the inside. The hook affords vertical and transverse resistance to prevent the rail from rolling or turning on sharp curves and turnouts; it also prevents the plate from buckling. The inside shoulder, in combination with the hook, eliminates any necking or cutting



**Fig. 1.**



**Fig. 2.**



**Fig. 3.**

of the spike by abrasion from the running or "back slap" of the rail. The general offices of the Spencer Otis Co. are in the Railway Exchange, Chicago. Branch offices are located in New York, St. Louis, Mo., St. Paul, Minn., Omaha, Neb., and Norfolk, Va., and the mills are at Portsmouth, Ohio.